

PRACTICE EXAM 16: CCAT GRADE 4 SIMULATION (176 QUESTIONS)

This practice exam contains 176 multiple-choice questions arranged in the same three groups as the real test: Verbal, Quantitative, and Nonverbal. Each question has four answer choices, labeled A through D, and only one is correct. Describe each rule in your own words before choosing, mark an answer for every question, and use the answer key and explanations afterward to review every item, including those you answered correctly. The real CCAT times each of its nine tests at 10 minutes, so you may wish to practice some sections with a timer.

1. Hourglass is to time as compass is to ____.

- A. weather
- B. distance
- C. color
- D. direction

2. Map is to explorer as recipe is to ____.

- A. farmer
- B. pilot
- C. cook
- D. singer

3. Ship is to sea as wagon is to ____.

- A. land
- B. sky
- C. ocean
- D. cloud

4. Explorer is to discover as builder is to ____.

- A. forget
- B. construct
- C. sleep
- D. borrow

5. Telescope is to stars as microscope is to ____.

- A. planets
- B. cells
- C. mountains
- D. oceans

6. Pharaoh is to Egypt as king is to ____.

- A. pyramid
- B. desert
- C. harvest
- D. kingdom

7. Museum is to artifacts as library is to ____.

- A. books
- B. ships
- C. coins
- D. tents

8. Sailor is to ship as pilot is to ____.

- A. harbor
- B. anchor
- C. airplane
- D. island

9. Ancient is to modern as old is to ____.

- A. aged
- B. new
- C. tall
- D. dusty

10. Quill is to writing as oar is to ____.

- A. reading
- B. sewing
- C. rowing
- D. digging

11. Captain is to crew as teacher is to ____.

- A. desks
- B. chalk
- C. bells
- D. students

12. Scout is to explore as guard is to ____.

- A. protect

- B. wander
- C. paint
- D. measure

13. Frozen is to Arctic as scorching is to ____.

- A. glacier
- B. iceberg
- C. tundra
- D. desert

14. Sail is to wind as engine is to ____.

- A. fuel
- B. sea
- C. mast
- D. anchor

15. Kennel is to dogs as nest is to ____.

- A. fish
- B. wind
- C. birds
- D. stones

16. Ancestor is to descendant as grandparent is to ____.

- A. cousin
- B. grandchild
- C. neighbor
- D. uncle

17. Atlas is to maps as dictionary is to ____.

- A. ships
- B. words
- C. dates
- D. kings

18. Cartographer is to map as author is to ____.

- A. ink
- B. library
- C. book
- D. reader

19. Discovery is to explorer as invention is to ____.

- A. inventor
- B. museum
- C. tool
- D. patent

20. Anchor is to ship as stake is to ____.

- A. river
- B. desert
- C. map
- D. tent

21. Because the sailors were very ____ after rowing all day, they fell asleep as soon as they reached the shore.

- A. loud
- B. purple
- C. early
- D. tired

22. The pirates buried the chest where nobody could see it, so it stayed ____ for many years.

- A. noisy
- B. fresh
- C. hidden
- D. bright

23. A long trip across the ocean by ship is called a ____.

- A. voyage
- B. recipe
- C. lesson
- D. noise

24. The ship was so ____ that it could carry hundreds of heavy barrels across the sea.

- A. tiny
- B. large
- C. sleepy
- D. silent

25. Long ago, a ____ rode a fast horse from town to town to carry important news.

- A. mountain
- B. puddle
- C. blanket
- D. messenger

26. The explorer kept a diary so that she could _____ what she saw each day.

- A. record
- B. forget
- C. spill
- D. borrow

27. Because the desert gets so little rain, plants there are very _____.

- A. crowded
- B. tall
- C. scarce
- D. wet

28. The crew ran low on food, so each person got only a _____ portion at dinner.

- A. giant
- B. small
- C. hot
- D. loud

29. Without a compass, the lost travelers could not tell which _____ to walk.

- A. color

- B. direction
- C. song
- D. season

30. Visitors gasped when they saw the ____ palace, with its tall golden doors and shining marble halls.

- A. plain
- B. crooked
- C. magnificent
- D. tiny

31. Early settlers had to be ____ because winters were long and supplies were few.

- A. resourceful
- B. wasteful
- C. careless
- D. lazy

32. The mountain pass was so ____ that only a few brave climbers tried to cross it.

- A. pleasant
- B. flat
- C. quiet
- D. dangerous

33. Nobody had ever mapped the island, so it was ____ to the sailors.

- A. famous
- B. unfamiliar
- C. crowded
- D. ordinary

34. The old stone wall was built to keep invaders ____ of the city.

- A. out
- B. above
- C. near
- D. inside

35. Although the journey over the frozen mountains was ____, the explorers refused to quit.

- A. easy
- B. short
- C. fun
- D. difficult

36. The brave ____ paddled the canoe across the ____ to reach the far shore.

- A. lake, explorer
- B. canoe, paddle
- C. explorer, lake
- D. shore, sailor

37. Even when the storm grew worse, the ____ explorer kept going until she reached the top of the peak.

- A. hesitant
- B. careless
- C. persistent
- D. bored

38. Many years later, a child looking for old toys ____ the diary in a dusty attic.

- A. invented
- B. discovered
- C. spoiled
- D. pretended

39. After the treaty ended the war, the two nations lived in _____ for many years.

- A. danger
- B. debt
- C. noise
- D. peace

40. The sailors felt _____ by the bright stars, which showed them the way home.

- A. guided
- B. frightened
- C. bored
- D. washed

41. Which word belongs with: canoe, raft, ferry?

- A. bicycle
- B. kayak
- C. wagon
- D. saddle

42. Which word belongs with: Atlantic, Pacific, Arctic?

- A. Sahara

- B. Alps
- C. Indian
- D. Nile

43. Which word belongs with: grandfather, aunt, uncle?

- A. cousin
- B. neighbor
- C. teacher
- D. captain

44. Which word belongs with: tent, igloo, cabin?

- A. boat
- B. bridge
- C. tower
- D. hut

45. Which word belongs with: pharaoh, queen, emperor?

- A. farmer
- B. sailor
- C. merchant
- D. king

46. Which word belongs with: gold, silver, copper?

- A. wool
- B. leather
- C. iron
- D. cotton

47. Which word belongs with: lantern, torch, candle?

- A. pillow
- B. lamp
- C. anchor
- D. bucket

48. Which word belongs with: sword, spear, dagger?

- A. arrow
- B. crown
- C. saddle
- D. coin

49. Which word belongs with: sail, mast, rudder?

- A. saddle
- B. pedal
- C. chimney
- D. deck

50. Which word belongs with: map, globe, atlas?

- A. statue
- B. trophy
- C. chart
- D. lantern

51. Which word belongs with: quill, parchment, ink?

- A. scroll
- B. anchor
- C. hammer
- D. paddle

52. Which word belongs with: plateau, valley, canyon?

- A. ocean
- B. mountain
- C. hurricane
- D. sunrise

53. Which word belongs with: glacier, iceberg, snowdrift?

- A. puddle
- B. icicle
- C. steam
- D. fog

54. Which word belongs with: telegraph, telephone, radio?

- A. television
- B. bicycle
- C. microscope
- D. calendar

55. Which word belongs with: musket, cannon, pistol?

- A. lantern

- B. compass
- C. rifle
- D. barrel

56. Which word belongs with: Egypt, Greece, Rome?

- A. Sahara
- B. Nile
- C. Alps
- D. Babylon

57. Which word belongs with: ally, partner, friend?

- A. enemy
- B. companion
- C. rival
- D. stranger

58. Which word belongs with: migrate, travel, journey?

- A. stay
- B. rest
- C. wander
- D. settle

59. Which word belongs with: Maya, Aztec, Inca?

- A. Andes
- B. Amazon
- C. Pacific
- D. Olmec

60. Two number pairs follow the same rule: $31 : 45$ and $58 : 72$. Which number goes with 47 ($47 : ?$) in the same way?

- A. 61
- B. 33
- C. 62
- D. 60

61. Two number pairs follow the same rule: $84 : 70$ and $53 : 39$. Which number goes with 96 ($96 : ?$) in the same way?

- A. 110
- B. 83
- C. 82
- D. 80

62. Two number pairs follow the same rule: $7 : 42$ and $9 : 54$. Which number goes with 12 ($12 : ?$) in the same way?

- A. 18
- B. 60
- C. 66
- D. 72

63. Two number pairs follow the same rule: $96 : 12$ and $56 : 7$. Which number goes with 72 ($72 : ?$) in the same way?

- A. 9
- B. 64
- C. 12

D. 8

64. Two number pairs follow the same rule: $18 : 27$ and $40 : 49$. Which number goes with 63 ($63 : ?$) in the same way?

A. 54

B. 72

C. 70

D. 81

65. Two number pairs follow the same rule: $5 : 35$ and $8 : 56$. Which number goes with 11 ($11 : ?$) in the same way?

A. 77

B. 18

C. 66

D. 70

66. Two number pairs follow the same rule: $120 : 24$ and $75 : 15$. Which number goes with 95 ($95 : ?$) in the same way?

A. 90

B. 19

C. 21

D. 17

67. Two number pairs follow the same rule: $4 : 19$ and $9 : 44$. Which number goes with 7 ($7 : ?$) in the same way?

A. 35

B. 33

- C. 34
- D. 28

68. Two number pairs follow the same rule: $8 : 72$ and $6 : 54$. Which number goes with 14 ($14 : ?$) in the same way?

- A. 23
- B. 112
- C. 134
- D. 126

69. Two number pairs follow the same rule: $15 : 6$ and $23 : 14$. Which number goes with 40 ($40 : ?$) in the same way?

- A. 31
- B. 49
- C. 25
- D. 34

70. Two number pairs follow the same rule: $150 : 50$ and $66 : 22$. Which number goes with 84 ($84 : ?$) in the same way?

- A. 81
- B. 28
- C. 42
- D. 25

71. Two number pairs follow the same rule: $3 : 22$ and $5 : 34$. Which number goes with 9 ($9 : ?$) in the same way?

- A. 54

- B. 62
- C. 58
- D. 31

72. Two number pairs follow the same rule: $18 : 11$ and $30 : 17$. Which number goes with 46 ($46 : ?$) in the same way?

- A. 23
- B. 25
- C. 35
- D. 28

73. Two number pairs follow the same rule: $5 : 36$ and $9 : 68$. Which number goes with 12 ($12 : ?$) in the same way?

- A. 96
- B. 88
- C. 104
- D. 92

74. Two number pairs follow the same rule: $9 : 31$ and $13 : 47$. Which number goes with 20 ($20 : ?$) in the same way?

- A. 80
- B. 71
- C. 29
- D. 75

75. Two number pairs follow the same rule: $78 : 13$ and $54 : 9$. Which number goes with 108 ($108 : ?$) in the same way?

- A. 18
- B. 102
- C. 12
- D. 24

76. Two number pairs follow the same rule: $16 : 52$ and $25 : 70$. Which number goes with 39 ($39 : ?$) in the same way?

- A. 78
- B. 59
- C. 98
- D. 101

77. Two number pairs follow the same rule: $44 : 20$ and $70 : 33$. Which number goes with 86 ($86 : ?$) in the same way?

- A. 43
- B. 41
- C. 77
- D. 39

78. Two number pairs follow the same rule: $7 : 49$ and $12 : 144$. Which number goes with 11 ($11 : ?$) in the same way?

- A. 77
- B. 110
- C. 132
- D. 121

79. Two number pairs follow the same rule: $14 : 25$ and $22 : 41$. Which number goes with 35 ($35 : ?$) in the same way?

- A. 67
- B. 70
- C. 48
- D. 64

80. Solve: $47 + ? = 83$. What number goes in the blank?

- A. 130
- B. 37
- C. 36
- D. 46

81. Solve: $? - 29 = 54$. What number goes in the blank?

- A. 25
- B. 73
- C. 82
- D. 83

82. Solve: $15 \times ? = 195$. What number goes in the blank?

- A. 180
- B. 210
- C. 13
- D. 12

83. Solve: $91 - ? = 58$. What number goes in the blank?

- A. 149
- B. 33
- C. 43

D. 34

84. Solve: $? \div 7 = 13$. What number goes in the blank?

A. 91

B. 6

C. 20

D. 84

85. Which sign makes this true? $13 ? 6 = 78$

A. plus

B. minus

C. divided by

D. times

86. Solve: $168 \div ? = 14$. What number goes in the blank?

A. 154

B. 182

C. 12

D. 13

87. Solve: $7 \times ? + 13 = 90$. What number goes in the blank?

A. 11

B. 77

C. 103

D. 10

88. Solve: $8 \times ? - 15 = 49$. What number goes in the blank?

- A. 64
- B. 8
- C. 34
- D. 7

89. Solve: $? \times 8 = 46 + 50$. What number goes in the blank?

- A. 96
- B. 12
- C. 11
- D. 13

90. Solve: $? + ? + 17 = 61$, and both blanks hold the same number. What number is it?

- A. 44
- B. 78
- C. 21
- D. 22

91. Which sign makes this true? $72 ? 9 = 8$

- A. divided by
- B. plus
- C. minus
- D. times

92. Solve: $? \times ? = 196$, and both blanks hold the same number. What number is it?

- A. 98
- B. 13
- C. 14
- D. 15

93. Solve: $64 \div ? + 9 = 25$. What number goes in the blank?

- A. 16
- B. 4
- C. 8
- D. 2

94. Solve: $(? + 8) \times 5 = 85$. What number goes in the blank?

- A. 9
- B. 17
- C. 25
- D. 77

95. Solve: $120 - ? - 45 = 38$. What number goes in the blank?

- A. 75
- B. 83
- C. 37
- D. 47

96. Each triangle stands for the same number, and $\text{triangle} + \text{triangle} + \text{triangle} = 57$. What is $\text{triangle} - 6$?

- A. 19
- B. 51

- C. 63
- D. 13

97. Which sign makes this true? $57 ? 19 = 38$

- A. plus
- B. times
- C. divided by
- D. minus

98. Solve: $5 \times ? + 3 \times ? = 72$, and both blanks hold the same number. What number is it?

- A. 9
- B. 8
- C. 24
- D. 10

99. What number comes next? 38, 47, 56, 65, ?

- A. 73
- B. 75
- C. 74
- D. 72

100. What number comes next? 97, 91, 85, 79, ?

- A. 72
- B. 73
- C. 74
- D. 67

101. What number comes next? 13, 26, 52, 104, ?

- A. 156
- B. 130
- C. 208
- D. 200

102. What number comes next? 22, 35, 48, 61, ?

- A. 73
- B. 74
- C. 75
- D. 87

103. What number comes next? 720, 360, 180, 90, ?

- A. 45
- B. 30
- C. 60
- D. 22

104. What number comes next? 95, 81, 67, 53, ?

- A. 38
- B. 40
- C. 25
- D. 39

105. What number comes next? 5, 20, 80, 320, ?

- A. 640
- B. 1600
- C. 1280
- D. 1000

106. What number comes next? 6, 8, 11, 15, 20, ?

- A. 26
- B. 25
- C. 27
- D. 30

107. What number comes next? 9, 10, 13, 18, 25, ?

- A. 32
- B. 33
- C. 38
- D. 34

108. What number comes next? 70, 60, 52, 46, 42, ?

- A. 38
- B. 40
- C. 39
- D. 36

109. What number comes next? 40, 52, 46, 58, 52, 64, ?

- A. 76
- B. 70
- C. 58

D. 64

110. What number comes next? 5, 7, 11, 19, 35, ?

A. 67

B. 51

C. 65

D. 69

111. What number comes next? 64, 32, 40, 20, 28, 14, ?

A. 7

B. 22

C. 28

D. 24

112. What number comes next? 8, 13, 23, 43, 83, ?

A. 166

B. 126

C. 160

D. 163

113. What number comes next? 5, 15, 12, 36, 33, 99, ?

A. 297

B. 102

C. 93

D. 96

114. What number comes next? 31, 90, 36, 80, 41, 70, 46, ?

- A. 60
- B. 51
- C. 56
- D. 50

115. What number comes next? 3, 11, 35, 107, ?

- A. 321
- B. 323
- C. 325
- D. 214

116. What number comes next? 2, 50, 6, 45, 18, 40, 54, ?

- A. 162
- B. 30
- C. 35
- D. 38

117. What number comes next? 2, 4, 12, 48, 240, ?

- A. 1200
- B. 1440
- C. 960
- D. 1680

118. What number comes next? 12, 3, 17, 6, 22, 9, 27, ?

- A. 32
- B. 15
- C. 12
- D. 10

119. In a 2 by 2 grid, the top row shows a small black star, then a large black star. The bottom row shows a small white hexagon, then a missing figure. Which figure completes the grid?

- A. a large white hexagon
- B. a small black hexagon
- C. a large black hexagon
- D. a large white star

120. In a 2 by 2 grid, the top row shows one black circle, then three black circles. The bottom row shows one white square, then a missing figure. Which figure completes the grid?

- A. three black squares
- B. three white circles
- C. two white squares
- D. three white squares

121. In a 2 by 2 grid, the top row shows a small white circle, then a large black circle. The bottom row shows a small black square, then a missing figure. Which figure completes the grid?

- A. a large black square
- B. a small white square
- C. a large white square
- D. a large white circle

122. In a 2 by 2 grid, the top row shows a white circle, then a white circle with a black dot inside. The bottom row shows a white square, then a missing figure. Which figure completes the grid?

- A. a black square with a black dot inside
- B. a white square with a black dot inside
- C. a white square with a white dot inside
- D. a white circle with a black dot inside

123. In a 2 by 2 grid, the top row shows a white triangle pointing up, then a white triangle pointing down. The bottom row shows a striped triangle pointing left, then a missing figure. Which figure completes the grid?

- A. a striped triangle pointing right
- B. a striped triangle pointing left
- C. a white triangle pointing right
- D. a striped triangle pointing up

124. In a 2 by 3 grid, the top row shows one white circle, two white circles, and three white circles. The bottom row shows one black diamond, two black diamonds, and a missing figure. Which figure completes the grid?

- A. three white diamonds
- B. two black diamonds
- C. three black circles
- D. three black diamonds

125. In a 3 by 3 grid, the first row shows three white circles, and the second row shows three black squares. The third row shows a gray hexagon, a gray hexagon, and a missing figure. Which figure completes the grid?

- A. a gray square
- B. a black hexagon
- C. a gray hexagon
- D. a white hexagon

126. In a 2 by 3 grid, the top row shows a white triangle, a white square, and a white star. The bottom row shows a black triangle, a black square, and a missing figure. Which figure completes the grid?

- A. a black star
- B. a white star
- C. a black circle
- D. a gray star

127. In a 2 by 2 grid, the top row shows a white square with a black dot in its top left corner, then a white square with a black dot in its top right corner. The bottom row shows a white circle with a black dot in its bottom left corner, then a missing figure. Which figure completes the grid?

- A. a white circle with a black dot in its bottom left corner
- B. a white circle with a black dot in its bottom right corner
- C. a white circle with a black dot in its top right corner
- D. a white square with a black dot in its bottom right corner

128. In a 2 by 2 grid, the top row shows a black arrow pointing up, then the same arrow pointing right. The bottom row shows a black arrow pointing left, then a missing figure. Which figure completes the grid?

- A. a black arrow pointing down
- B. a black arrow pointing left
- C. a black arrow pointing right
- D. a black arrow pointing up

129. In a 3 by 3 grid, the first row shows a black diamond, a white diamond, and a gray diamond. The second row shows a white diamond, a gray diamond, and a black diamond. The third row shows a gray diamond, a black diamond, and a missing figure. Which figure completes the grid?

- A. a gray diamond
- B. a white diamond

- C. a black diamond
- D. a striped diamond

130. In a 2 by 3 grid, the top row shows a white circle with a black dot on its left side, then on its top side, then on its right side. The bottom row shows a gray square with a black dot on its top side, then on its right side, and a missing figure. Which figure completes the grid?

- A. a gray square with a black dot on its left side
- B. a gray square with a black dot on its top side
- C. a gray circle with a black dot on its bottom side
- D. a gray square with a black dot on its bottom side

131. In a 2 by 2 grid, the top row shows two small black squares, then five small black squares. The bottom row shows four small white circles, then a missing figure. Which figure completes the grid?

- A. seven small black circles
- B. six small white circles
- C. seven small white circles
- D. seven small white squares

132. In a 3 by 3 grid, the first row shows an arrow pointing up, right, and down. The second row shows an arrow pointing right, down, and left. The third row shows an arrow pointing down, left, and a missing figure. Which figure completes the grid?

- A. an arrow pointing up
- B. an arrow pointing down
- C. an arrow pointing right
- D. an arrow pointing left

133. In a 3 by 3 grid, every figure is a group of black dots. The first row shows 2 dots, 3 dots, and 5 dots. The second row shows 1 dot, 4 dots, and 5 dots. The third row shows 4 dots, 3 dots, and a missing figure. Which figure completes the grid?

- A. 7 black dots
- B. 6 black dots
- C. 12 black dots
- D. 1 black dot

134. In a 3 by 3 grid, the first row shows a black circle, a white square, and a gray triangle. The second row shows a white square, a gray triangle, and a black circle. The third row shows a gray triangle, a black circle, and a missing figure. Which figure completes the grid?

- A. a black square
- B. a white square
- C. a white triangle
- D. a gray square

135. In a 2 by 2 grid, the top row shows a black arrow pointing up, then a white arrow pointing right. The bottom row shows a white arrow pointing left, then a missing figure. Which figure completes the grid?

- A. a white arrow pointing up
- B. a black arrow pointing down
- C. a black arrow pointing left
- D. a black arrow pointing up

136. In a 3 by 3 grid, every figure is white. The first row shows a triangle, a square, and a pentagon. The second row shows a square, a pentagon, and a hexagon. The third row shows a pentagon, a hexagon, and a missing figure. Which figure completes the grid?

- A. a shape with six sides
- B. a shape with eight sides
- C. a shape with seven sides
- D. a shape with five sides

137. In a 3 by 3 grid, the first row shows one white square, two white squares, and three white squares. The second row shows two black circles, three black circles, and four black circles. The third row shows three gray triangles, four gray triangles, and a missing figure. Which figure completes the grid?

- A. four gray triangles
- B. five gray triangles
- C. six gray triangles
- D. five black triangles

138. In a 3 by 3 grid, the first row shows one small black circle, two medium black circles, and three large black circles. The second row shows one small white square, two medium white squares, and three large white squares. The third row shows one small gray triangle, two medium gray triangles, and a missing figure. Which figure completes the grid?

- A. three large gray triangles
- B. three medium gray triangles
- C. three large black triangles
- D. two large gray triangles

139. A square sheet of paper is folded in half once. A hole punch makes three holes in the folded paper, all away from the fold. How many holes does the unfolded sheet have?

- A. 3 holes
- B. 4 holes
- C. 6 holes
- D. 12 holes

140. A long paper strip is folded like an accordion into three equal layers, using two zigzag folds. One hole is punched through all the layers. How many holes does the opened strip have?

- A. 2 holes
- B. 1 hole
- C. 6 holes
- D. 3 holes

141. A square sheet is folded corner to corner to make a triangle. Two holes are punched away from the fold, and one more hole is punched exactly on the fold. How many holes does the unfolded sheet have?

- A. 3 holes
- B. 5 holes
- C. 4 holes
- D. 6 holes

142. A square sheet is folded in half, and then folded in half again the other way. Three holes are punched through the folded shape, all away from every crease. How many holes does the unfolded sheet have?

- A. 6 holes
- B. 9 holes
- C. 12 holes
- D. 8 holes

143. A square sheet is folded in half. A small triangle is cut out of the folded edge, with its flat side lying along the crease. What does the cut-out look like when the sheet is unfolded?

- A. a triangle hole on the fold line
- B. two triangle holes with a gap between
- C. a round hole on the fold line
- D. a four-sided diamond hole on the fold line

144. A square sheet is folded in half. A half circle is cut out of the folded edge, with its straight side lying along the crease. What does the cut-out look like when the sheet is unfolded?

- A. one whole circle on the fold line
- B. one half circle on one side
- C. one square on the fold line
- D. one triangle on the fold line

145. A square sheet of paper is folded in half by bringing its top edge down to its bottom edge. One hole is punched near the right edge of the folded shape, halfway between the crease and the open edge. Which choice describes the unfolded sheet?

- A. One hole near the right edge, in the middle of the sheet
- B. Two holes near the right edge, both low down on the sheet
- C. Two holes near the bottom edge, one on each side of the sheet
- D. Two holes near the right edge, one high and one low

146. A square sheet of paper is folded in half by bringing its left edge over to its right edge. One hole is punched close to the top right corner of the folded shape. Which choice describes the unfolded sheet?

- A. Two holes near the top, one close to each side edge
- B. Two holes near the top, both close to the middle
- C. Two holes near the right edge, one high and one low
- D. One hole near the top right corner of the sheet

147. A square sheet of paper is folded in half by bringing its bottom edge up to its top edge. One hole is punched close to the top left corner of the folded shape. Which choice describes the unfolded sheet?

- A. Two holes near the left edge, both near the middle height
- B. Two holes near the top edge, one close to each side
- C. Two holes near the left edge, one high and one low
- D. One hole near the top left corner of the sheet

148. A square sheet is folded in half once. Five holes are punched away from the fold, and two more holes are punched exactly on the fold. How many holes does the unfolded sheet have?

- A. 14 holes
- B. 12 holes
- C. 10 holes
- D. 7 holes

149. A square sheet is folded corner to corner to make a triangle, and then that triangle is folded in half again to make a smaller triangle. Two holes are punched through all the layers, away from every crease. How many holes does the unfolded sheet have?

- A. 8 holes
- B. 4 holes
- C. 6 holes
- D. 16 holes

150. A square sheet is folded in half by bringing its left edge over to its right edge, and then folded in half again by bringing its top edge down to its bottom edge. One hole is punched close to the corner of the small folded square that is farthest from the center of the sheet. Which choice describes the unfolded sheet?

- A. Four holes close together around the center of the sheet
- B. Two holes close to the top corners of the sheet
- C. Four holes, one close to each corner of the sheet
- D. One hole close to one corner of the sheet

151. A square sheet is folded in half by bringing its bottom edge up to its top edge, and then folded in half again by bringing its right edge over to its left edge. One hole is punched close to the corner of the small folded square where the two creases meet, a little way inside that corner. Which choice describes the unfolded sheet?

- A. Four holes, one close to each corner of the sheet
- B. One hole in the exact center of the sheet
- C. Two holes close together, one above the other near the center
- D. Four holes close together around the center of the sheet

152. A square sheet is folded in half three times, and each fold makes the shape half as big. Two holes are punched through the folded shape, away from every crease. How many holes does the unfolded sheet have?

- A. 8 holes
- B. 16 holes
- C. 6 holes
- D. 32 holes

153. A square sheet was folded in half twice. Some holes were punched through the folded paper, all away from every crease. When the sheet is opened, it shows 20 holes. How many holes were punched through the folded paper?

- A. 10 holes
- B. 5 holes
- C. 4 holes
- D. 20 holes

154. A square sheet is folded in half by bringing its left edge over to its right edge, and then folded in half the same way again. Two holes are punched through the narrow strip, one near the top and one near the bottom, both in the middle of the strip's width. Which choice describes the unfolded sheet?

- A. Eight holes: two rows of four, near the top and bottom
- B. Four holes: two near the top and two near the bottom
- C. Eight holes: four high and four low, all in the right half
- D. Six holes: three near the top and three near the bottom

155. A square sheet is folded in half by bringing its left edge over to its right edge, and then folded in half again by bringing its bottom edge up to its top edge. One hole is punched close to the bottom edge of the small folded square, halfway across it. Which choice describes the unfolded sheet?

- A. Four holes in a small square around the center of the sheet
- B. Four holes, one close to each of the four sheet corners
- C. Two holes near the middle height, one in each half of the sheet
- D. Four holes: a close pair in each half, near the middle height

156. A square sheet is folded in half by bringing its left edge over to its right edge, and then folded in half again by bringing its bottom edge up to its top edge. One hole is punched exactly at the corner of the small folded square where the two creases meet. How many holes does the unfolded sheet have?

- A. 4 holes
- B. 2 holes
- C. 1 hole
- D. 3 holes

157. A square sheet is folded in half by bringing its left edge over to its right edge, and then folded in half again by bringing its bottom edge up to its top edge. Two holes are punched away from every crease, and one more hole is punched exactly in the middle of the left edge of the folded shape, which is the first crease. How many holes does the unfolded sheet have?

- A. 10 holes
- B. 12 holes
- C. 14 holes
- D. 8 holes

158. Three figures are shown. The first is a black circle. The second is a black square. The third is a black hexagon. Which figure is most like the first three?

- A. a white star

- B. a gray star
- C. a striped star
- D. a black star

159. Three figures are shown. The first is a large white circle. The second is a large white star. The third is a large white square. Which figure is most like the first three?

- A. a small white heart
- B. a large white heart
- C. a large black heart
- D. a large gray heart

160. Three figures are shown. The first is a striped triangle. The second is a striped circle. The third is a striped square. Which figure is most like the first three?

- A. a dotted star
- B. a white star
- C. a striped star
- D. a black star

161. Three figures are shown. The first is four small circles in a row. The second is four small squares in a row. The third is four small triangles in a row. Which figure is most like the first three?

- A. five small stars in a row
- B. four small stars in a row
- C. three small stars in a row
- D. one large star

162. Three figures are shown. The first is a small square. The second is a long rectangle. The third is a tilted diamond. Which figure is most like the first three?

- A. a triangle with three sides
- B. a pentagon with five sides
- C. a hexagon with six sides
- D. a kite with four sides

163. Three figures are shown. The first is a white arrow pointing right. The second is a black triangle pointing right. The third is a gray pentagon pointing right. Which figure is most like the first three?

- A. a white triangle pointing left
- B. a white triangle pointing up
- C. a white triangle pointing right
- D. a white triangle pointing down

164. Three figures are shown. The first is a square cut into two equal triangles. The second is a circle cut into two equal halves. The third is a hexagon cut into two equal halves. Which figure is most like the first three?

- A. a rectangle cut into two equal halves
- B. a rectangle cut into three equal parts
- C. a rectangle cut into four equal parts
- D. a rectangle cut into two unequal parts

165. Three figures are shown. The first is a circle. The second is an oval. The third is a ring with a hole in the middle. Which figure is most like the first three?

- A. a star with five points
- B. a rectangle with four corners
- C. a triangle with three corners
- D. a smooth egg shape

166. Three figures are shown. The first is a circle with a black dot inside. The second is a square with a black dot inside. The third is a triangle with a black dot inside. Which figure is most like the first three?

- A. a pentagon with a black dot below it
- B. a pentagon with nothing inside
- C. a pentagon with a black dot inside
- D. a pentagon with a black square inside

167. Three figures are shown. The first is a circle with one straight line across it. The second is a square with one straight line across it. The third is a triangle with one straight line across it. Which figure is most like the first three?

- A. a hexagon with one straight line across it
- B. a hexagon with two straight lines across it
- C. a hexagon with no lines on it
- D. a hexagon with one curved line across it

168. Three figures are shown. The first is a small circle sitting above a large circle. The second is a small star sitting above a large star. The third is a small heart sitting above a large heart. Which figure is most like the first three?

- A. a large square above a small square
- B. a small square above a large square
- C. a small square beside a large square
- D. two equal squares, one above the other

169. Three figures are shown. The first is a circle with its bottom half black and its top half white. The second is a square with its bottom half black and its top half white. The third is a triangle with its bottom half black and its top half white. Which figure is most like the first three?

- A. a star with its top half black and its bottom half white
- B. a star with its left half black and its right half white
- C. a star that is all black
- D. a star with its bottom half black and its top half white

170. Three figures are shown. The first is two black circles and one white circle. The second is two black squares and one white square. The third is two black triangles and one white triangle. Which figure is most like the first three?

- A. one black star and two white stars
- B. two black stars and two white stars
- C. two black stars and one white star
- D. three black stars

171. Three figures are shown. The first is a white circle with a small black square inside it. The second is a white triangle with a small black circle inside it. The third is a white square with a small black triangle inside it. Which figure is most like the first three?

- A. a black star with a small white circle inside
- B. a white star with a small black circle inside
- C. a white star with a small gray circle inside
- D. a white star with a small black circle beside it

172. Three figures are shown. The first is two circles that touch at exactly one point. The second is two squares that touch at exactly one point. The third is two triangles that touch at exactly one point. Which figure is most like the first three?

- A. two stars that touch at exactly one point
- B. two stars that overlap each other
- C. two stars that are far apart
- D. two stars with a small gap between them

173. Three figures are shown. The first is three black dots and three white dots. The second is two squares and four triangles. The third is five stars and one circle. Which figure is most like the first three?

- A. five hearts in a row
- B. seven hearts in a row
- C. six hearts in a row
- D. four hearts in a row

174. Three figures are shown. The first is a triangle with three dots inside it. The second is a square with four dots inside it. The third is a pentagon with five dots inside it. Which figure is most like the first three?

- A. a hexagon with five dots inside it
- B. a hexagon with four dots inside it
- C. a hexagon with seven dots inside it
- D. a hexagon with six dots inside it

175. Three figures are shown. The first is three circles in a row that get bigger from left to right. The second is three squares in a row that get bigger from left to right. The third is three triangles in a row that get bigger from left to right. Which figure is most like the first three?

- A. three stars in a row that get smaller from left to right
- B. three stars in a row that get bigger from left to right
- C. three stars in a row that are all the same size
- D. three stars in a row with the biggest in the middle

176. Three figures are shown. The first is a shape with four sides. The second is a shape with six sides. The third is a shape with eight sides. Which figure is most like the first three?

- A. a shape with ten sides
- B. a shape with nine sides
- C. a shape with seven sides
- D. a shape with five sides

Practice Exam 16: Answer Key and Explanations

- 1. D** — An hourglass is a tool that measures time using falling sand, and a compass is a tool that shows direction. Each tool tells one kind of fact to the person using it. Weather, distance, and color are not shown by a compass needle, so those words do not fit. Only direction matches the way time matches hourglass.
- 2. C** — An explorer follows a map to find the way, and a cook follows a recipe to make a dish. Both are guides that a person reads while working. A farmer, a pilot, and a singer may use other tools, but none of them depends on a recipe the way a cook does when preparing food.
- 3. A** — A ship carries people across the sea, and a wagon carries people across land. Both pairs name the place where a vehicle travels. The sky and a cloud belong to birds and airplanes, and an ocean is water, which a wagon cannot cross. Land is the only place where a wagon rolls.
- 4. B** — An explorer travels in order to discover new places, and a builder works in order to construct houses and bridges. In each pair, the word names the main job. Forget, sleep, and borrow are things anyone might do, but none of them is what a builder is known for doing at work.
- 5. B** — A telescope helps us see things that are very far away, like stars, and a microscope helps us see things that are too small to see, like cells. Planets, mountains, and oceans are large objects that people can see without a microscope, so they do not match. Cells fit the pattern.
- 6. D** — A pharaoh ruled the land of Egypt, and a king rules a kingdom. In both pairs, a leader is matched to the land that he or she governs. A pyramid is a building, a desert is a dry place, and a harvest is a gathering of crops, so none of them is ruled by a king.
- 7. A** — A museum is a place that keeps and shows old objects called artifacts, and a library is a place that keeps and lends books. Each pair matches a building with what it holds. Ships, coins, and tents could appear in a museum, but a library is not mainly a place for them.
- 8. C** — A sailor steers a ship across the water, and a pilot flies an airplane through the air. Each pair joins a worker with the vehicle that he or she controls. A harbor and an island are places, and an anchor is only one part of a ship, so none of them is something a pilot flies.
- 9. B** — Ancient and modern are opposites, because ancient means very old and modern means of today. Old and new are opposites in the same way. Aged means the same thing as old, so it repeats the first word instead of opposing it. Tall and dusty are not opposites of old at all.
- 10. C** — A quill is a feather pen that people long ago used for writing, and an oar is a long paddle that people use for rowing a boat. Each pair joins a tool to its job. Reading, sewing, and digging need other tools, such as books, needles, and shovels, not an oar.
- 11. D** — A captain leads the crew on a ship, and a teacher leads the students in a classroom. Both pairs join a leader with the group of people being led. Desks, chalk, and bells are objects found in a school, but they are things and not people, so they cannot be led in that way.

12. A — A scout goes ahead to explore new land, and a guard stands watch to protect people or places. Each word names the main duty of the worker. A guard who started to wander would leave the post, and painting or measuring is not what guards are asked to do, so protect is the best fit.

13. D — The Arctic is known for being frozen, and a desert is known for being scorching hot. Each pair joins a describing word to a place where it is true. A glacier, an iceberg, and the tundra are all cold, icy places, so none of them could be called scorching in the same way.

14. A — A sail catches the wind, and the wind gives a sailing ship its power to move. An engine runs on fuel, and the fuel gives it power in the same way. The sea is only where a boat travels, a mast holds up a sail, and an anchor holds a ship still, so those do not supply power.

15. C — A kennel is a shelter where dogs rest and stay safe, and a nest is a shelter where birds rest and raise their young. Each pair joins a home with the animal that uses it. Fish live in water, not in nests, and wind and stones are not creatures that need a sheltered home.

16. B — An ancestor comes earlier in a family line, and a descendant comes later in that same line. A grandparent comes earlier, and a grandchild comes later in the same way. A cousin and an uncle are in the family but not in the same line, and a neighbor is not family at all.

17. B — An atlas is a book that collects many maps, and a dictionary is a book that collects many words with their meanings. Each pair joins a book to the thing it gathers. Ships, dates, and kings may be mentioned in a history book, but a dictionary is made to list words, so words is the answer.

18. C — A cartographer is a person who makes maps, and an author is a person who makes books by writing them. Each pair joins a maker with the thing he or she creates. Ink is only a material, a library is where books are kept, and a reader uses a book without making it.

19. A — A discovery is something an explorer finds, and an invention is something an inventor creates. Each pair joins a result with the person who produces it. A museum may display an invention and a patent protects it, but neither one makes it. A tool can be an invention, yet it is not a person.

20. D — An anchor holds a ship in one place so it does not drift, and a stake is driven into the ground to hold a tent in place so wind cannot blow it away. Each pair joins a holding tool with the thing it secures. A river, a desert, and a map are not held down by a stake.

21. D — The clue is that the sailors fell asleep right after rowing all day, which tells us they were tired. Rowing for many hours would wear out anyone. Loud, purple, and early do not explain why people would fall asleep quickly, and purple is a color, not a feeling, so tired is the only word that makes sense.

22. C — The pirates buried the chest so that nobody could see it, which means it stayed hidden. The word hidden connects to the clue about being buried out of sight. Noisy, fresh, and bright describe sounds, foods, or lights, and none of them tells what happens to a chest buried underground for years.

23. A — The sentence describes a long trip by ship across the ocean, and the word for that kind of trip is a voyage. Sailors and explorers often wrote about their voyages. A recipe is a set of cooking steps, a lesson is something taught, and a noise is a sound, so none of them names a trip.

- 24. B** — To carry hundreds of heavy barrels, a ship must have plenty of room, so the best word is large. A tiny ship would not hold that many barrels. Sleepy and silent can describe people or places, but they say nothing about how much cargo a ship can carry, so they do not complete the sentence.
- 25. D** — People had no phones long ago, so a person on a fast horse carried news, and that person is called a messenger. The word rode shows that the answer must be a living person. A mountain, a puddle, and a blanket cannot ride a horse, so they do not fit the sentence.
- 26. A** — A diary is used for writing things down, so the explorer kept one to record what she saw. Record means to write down for later. Forget is the opposite of the purpose of a diary, and spill and borrow do not connect to seeing and writing about things, so they make the sentence silly.
- 27. C** — Little rain means that few plants can grow, so plants in a desert are scarce, meaning there are not many. Crowded would mean the opposite, and wet cannot describe a place with almost no rain. Tall is possible for a few plants, but the reason in the sentence is about how few there are.
- 28. B** — When food runs low, people must share what is left, so each portion becomes small. The word only in the sentence also points to a little bit of food. A giant portion would use up the supply, and hot and loud do not tell about how much food is on a plate.
- 29. B** — A compass shows north, south, east, and west, so without one the travelers could not tell which direction to walk. The sentence is about finding the way. A color, a song, and a season are things a compass does not show, and none of them is a choice about where to walk.
- 30. C** — Golden doors and shining marble halls describe a grand and beautiful building, so the best word is magnificent. Plain and tiny are the opposite of grand, and a crooked palace would not make people gasp with delight. The clues in the sentence all point to something impressive and splendid, which is the meaning of magnificent.
- 31. A** — Resourceful means good at finding ways to use what you have, and that is what settlers needed when supplies ran low in long winters. Wasteful and careless people would use up their supplies too fast, and lazy people would not work to survive. The reason in the sentence points to clever, careful use of resources.
- 32. D** — Only a few brave climbers tried the pass, which tells us it was dangerous and risky. People do not need courage to cross a pleasant place. A pass in the mountains would not be flat, and quiet describes sound, not risk, so neither explains why most people chose to stay away from it.
- 33. B** — If nobody had mapped the island, the sailors did not know it, so it was unfamiliar to them. Famous would mean many people knew about it, and ordinary suggests the sailors had seen places like it before. Crowded describes a place with many people and does not match the clue about a new island.
- 34. A** — A wall protects a city by stopping enemies from coming in, so it keeps invaders out of the city. The word of must follow the answer, and out of the city is the natural phrase. Above of and near of do not make sense in this sentence, and inside would mean the wall let enemies in.

35. D — The word although signals a contrast, so the journey must have been something that would make people want to quit. Difficult fits that idea. If the journey had been easy, short, or fun, the explorers would have had no reason to quit, so the contrast word although would make no sense.

36. C — A person paddles a canoe, so the first blank needs a person, and the explorer fits. Then the canoe crosses a body of water to reach the far shore, which makes lake fit the second blank. The pair lake, explorer reverses the order, and the other pairs put objects or places where a paddling person belongs.

37. C — Persistent means never giving up, and the explorer kept going even when the storm grew worse. Hesitant means unsure and slow to act, so it is the opposite. Careless and bored do not explain why she kept going through danger, because careless people are not likely to finish a hard climb.

38. B — The child was looking for toys and found the diary, so the word discovered fits. To discover is to find something that was hidden or lost. A child cannot invent something that already exists, and spoiled and pretended do not match the idea of finding a diary in a dusty place.

39. D — A treaty is an agreement that ends a war, so after it the two nations lived in peace. Danger would suggest that the fighting had not stopped. Debt and noise are not results that people expect from a treaty, and neither one describes the way nations live together after a war ends.

40. A — Stars helped sailors find their way home, so the sailors were guided by them. The clue that the stars showed the way points to guided. Frightened and bored are feelings that do not match the stars helping them, and washed does not make sense with the word by, since stars cannot wash anyone.

41. B — Canoe, raft, and ferry are all boats that float and carry people across water. A kayak is also a small boat, so it belongs in the group. A bicycle, a wagon, and a saddle are used on land, and none of them can float on a river or a lake the way the first three do.

42. C — Atlantic, Pacific, and Arctic are the names of oceans, and the Indian Ocean is the fourth one in the group. The Sahara is a desert, the Alps are mountains, and the Nile is a river. Each of those is a famous place, but none of them is an ocean, so they do not belong with the first three.

43. A — Grandfather, aunt, and uncle are all members of a family, and a cousin is also a relative. A neighbor lives nearby but is not in the same family, and a teacher and a captain are jobs that anyone might hold. Only cousin joins the first three as a family relationship.

44. D — A tent, an igloo, and a cabin are all small places where people live or stay, so a hut belongs with them. A boat is a vehicle, a bridge is used to cross a gap, and a tower is mainly a tall structure for watching or signaling. None of those is a simple home like the first three.

45. D — Pharaoh, queen, and emperor are all rulers who lead a country or an empire. A king is also a ruler, so it belongs in the group. A farmer grows food, a sailor works on a ship, and a merchant sells goods, so none of these has the power to rule that the first three share.

46. C — Gold, silver, and copper are metals that people dug from the ground and shaped into coins and tools. Iron is another metal, so it belongs with them. Wool, leather, and cotton are soft materials that come from animals or plants and are used for clothing, so they do not match the metals.

47. B — A lantern, a torch, and a candle are all ways to make light in the dark, and a lamp does the same job. A pillow is for sleeping, an anchor holds a ship in place, and a bucket carries water. None of those three gives light, so they do not belong with the group.

48. A — Sword, spear, and dagger are all weapons used long ago in battle, and an arrow is also a weapon. A crown is worn by a ruler, a saddle sits on a horse, and a coin is used to buy things. None of them is made to fight, so they do not belong with the first three.

49. D — Sail, mast, and rudder are all parts of a sailing ship, and the deck is the floor that people walk on, so it is also part of the ship. A saddle belongs to a horse, a pedal belongs to a bicycle, and a chimney belongs to a house. None of those is found on a ship.

50. C — A map, a globe, and an atlas all show where places are on Earth, and a chart does the same for the sea or the sky. A statue is an art figure, a trophy is a prize, and a lantern gives light. None of those three helps a traveler find places, so they do not belong with the group.

51. A — Quill, parchment, and ink are what scribes used long ago to write, and a scroll is a rolled sheet people wrote on, so it belongs with them. An anchor holds a ship, a hammer drives nails, and a paddle moves a canoe. None of those is a writing supply, so none fits the group.

52. B — Plateau, valley, and canyon are all landforms, which are shapes of the land on Earth, and a mountain is another landform. An ocean is a body of water, a hurricane is a storm, and a sunrise is an event in the sky. None of those is a shape of the land, so they do not match.

53. B — Glacier, iceberg, and snowdrift are all large or small things made of frozen water, and an icicle is also frozen water. A puddle is liquid, steam is a hot gas, and fog is tiny drops hanging in air. None of those three is frozen, so they do not belong with the first three.

54. A — Telegraph, telephone, and radio are all machines that send messages or sound over a distance, and a television also sends pictures and sound across a distance. A bicycle carries a rider, a microscope magnifies small things, and a calendar lists dates. None of those three sends messages, so they do not fit.

55. C — Musket, cannon, and pistol are all guns that soldiers and sailors used in battle, and a rifle is another kind of gun. A lantern gives light, a compass shows direction, and a barrel stores goods. None of those three can shoot, so they do not belong with the group of guns used in battle.

56. D — Egypt, Greece, and Rome were great ancient civilizations that built cities and left written records, and Babylon was another one. The Sahara is a desert, the Nile is a river, and the Alps are mountains. Those are places in nature and not civilizations, so only Babylon belongs with the first three.

57. B — Ally, partner, and friend all name someone who is on your side or works with you, and a companion is a person who travels or stays with you. An enemy and a rival work against you, and a

stranger is someone you do not know. Only companion shares the friendly meaning of the first three words.

58. C — Migrate, travel, and journey all mean to move from one place to another, and wander also means to move about. Stay, rest, and settle all mean to stop in one place, which is the opposite idea. Only wander shares the meaning of going from place to place, so it is the word that belongs.

59. D — The Maya, Aztec, and Inca were great peoples of ancient America who built cities, and the Olmec were also an early people there. The Andes are mountains, the Amazon is a river, and the Pacific is an ocean. These are places in nature, not peoples, so only Olmec belongs with the group.

60. A — In $31 : 45$ and $58 : 72$, the second number is 14 more than the first, since $31 + 14 = 45$ and $58 + 14 = 72$. Adding 14 to 47 gives 61. The choice 33 subtracts 14 instead, and the choices 60 and 62 miss the sum by one, so neither follows the rule.

61. C — In $84 : 70$ and $53 : 39$, the second number is 14 less than the first, since $84 - 14 = 70$ and $53 - 14 = 39$. Taking 14 from 96 gives 82. The choice 110 adds 14 instead of subtracting. The choices 83 and 80 are off by one and by two, so neither fits.

62. D — In $7 : 42$ and $9 : 54$, the second number is six times the first, since $7 \times 6 = 42$ and $9 \times 6 = 54$. Multiplying 12 by 6 gives 72. The choice 18 adds 6 instead of multiplying, the choice 60 is five times 12, and 66 is only close.

63. A — In $96 : 12$ and $56 : 7$, the second number is one eighth of the first, since $96 \div 8 = 12$ and $56 \div 8 = 7$. Dividing 72 by 8 gives 9. The choice 64 subtracts 8 instead, 12 repeats the first pair, and 8 is one too small, so none follow the rule.

64. B — In $18 : 27$ and $40 : 49$, the second number is 9 more than the first, since $18 + 9 = 27$ and $40 + 9 = 49$. Adding 9 to 63 gives 72. The choice 54 subtracts 9 instead of adding, 70 adds only 7, and 81 adds 18, so none fit.

65. A — In $5 : 35$ and $8 : 56$, the second number is seven times the first, since $5 \times 7 = 35$ and $8 \times 7 = 56$. Multiplying 11 by 7 gives 77. The choice 18 adds 7 instead of multiplying, the choice 66 is six times 11, and the choice 70 is only close.

66. B — In $120 : 24$ and $75 : 15$, the second number is one fifth of the first, since $120 \div 5 = 24$ and $75 \div 5 = 15$. Dividing 95 by 5 gives 19. The choice 90 subtracts 5 instead, and the choices 21 and 17 are two away from the right answer, so none fit.

67. C — In $4 : 19$ and $9 : 44$, the rule is to multiply by 5 and then subtract 1, since $4 \times 5 - 1 = 19$ and $9 \times 5 - 1 = 44$. For 7, that gives $35 - 1$, which is 34. The choice 35 forgets to subtract, 33 subtracts 2, and 28 multiplies by 4.

68. D — In $8 : 72$ and $6 : 54$, the second number is nine times the first, since $8 \times 9 = 72$ and $6 \times 9 = 54$. Multiplying 14 by 9 gives 126. The choice 23 adds 9 instead of multiplying, 112 is eight times 14, and 134 is only close.

69. A — In $15 : 6$ and $23 : 14$, the second number is 9 less than the first, since 15 minus 9 is 6 and 23 minus 9 is 14. Taking 9 from 40 gives 31. The choice 49 adds 9 instead of subtracting. The choice 25 takes away 15, and 34 takes away only 6, so neither fits.

70. B — In $150 : 50$ and $66 : 22$, the second number is one third of the first, since 150 divided by 3 is 50 and 66 divided by 3 is 22. Dividing 84 by 3 gives 28. The choice 81 subtracts 3 instead, 42 is half of 84, and 25 is a near guess, so none fit.

71. C — In $3 : 22$ and $5 : 34$, the rule is to multiply by 6 and then add 4, since 3 times 6 plus 4 is 22 and 5 times 6 plus 4 is 34. For 9, that gives 54 plus 4, or 58. The choice 54 forgets to add 4, 62 adds 8, and 31 adds 22.

72. B — In $18 : 11$ and $30 : 17$, the rule is to take half and then add 2, since half of 18 is 9, plus 2 is 11, and half of 30 is 15, plus 2 is 17. Half of 46 is 23, plus 2 is 25. The choice 23 forgets to add 2, and 35 and 28 miss.

73. D — In $5 : 36$ and $9 : 68$, the rule is to multiply by 8 and then subtract 4, since 5 times 8 minus 4 is 36 and 9 times 8 minus 4 is 68. For 12, that gives 96 minus 4, which is 92. The choice 96 forgets to subtract, 88 subtracts 8, and 104 adds 8 by mistake.

74. D — In $9 : 31$ and $13 : 47$, the rule is to multiply by 4 and then subtract 5, since 9 times 4 minus 5 is 31 and 13 times 4 minus 5 is 47. For 20, that gives 80 minus 5, or 75. The choice 80 forgets to subtract, 71 subtracts 9, and 29 adds 9 to 20.

75. A — In $78 : 13$ and $54 : 9$, the second number is one sixth of the first, since 78 divided by 6 is 13 and 54 divided by 6 is 9. Dividing 108 by 6 gives 18. The choice 102 subtracts 6 instead of dividing, 12 divides by 9, and 24 divides by 4.5, so none fit.

76. C — In $16 : 52$ and $25 : 70$, the rule is to double and then add 20, since 16 times 2 plus 20 is 52 and 25 times 2 plus 20 is 70. For 39, double is 78, and 78 plus 20 is 98. The choice 78 forgets to add 20, 59 adds 20 only, and 101 adds 23.

77. B — In $44 : 20$ and $70 : 33$, the rule is to take half and then subtract 2, since half of 44 is 22, minus 2 is 20, and half of 70 is 35, minus 2 is 33. Half of 86 is 43, minus 2 is 41. The choice 43 forgets the subtraction, and 77 and 39 break the rule.

78. D — In $7 : 49$ and $12 : 144$, each number is multiplied by itself, since 7 times 7 is 49 and 12 times 12 is 144. Multiplying 11 by itself gives 121. The choice 77 is 11 times 7, which uses the first pair only. The choice 110 is 11 times 10, and 132 is 11 times 12.

79. A — In $14 : 25$ and $22 : 41$, the rule is to double and then subtract 3, since 14 times 2 minus 3 is 25 and 22 times 2 minus 3 is 41. For 35, double is 70, and 70 minus 3 is 67. The choice 70 forgets to subtract, 48 adds 13, and 64 subtracts 6.

80. C — To find the missing number, subtract: 83 minus 47 equals 36, and 47 plus 36 checks back to 83. The choice 130 adds 47 and 83 together, which uses the wrong operation. The choices 37 and 46 are close to the answer but too large, since 47 plus 37 is 84 and 47 plus 46 is 93.

81. D — The missing number is what you start with before taking away 29, so add 29 to 54 to get 83, and 83 minus 29 checks to 54. The choice 25 subtracts 29 from 54 instead, which is the wrong operation. The choice 73 is ten too low, and 82 is one too low, so neither works.

82. C — Divide 195 by 15 to find the missing factor, which gives 13, and 15 times 13 checks back to 195. The choice 180 subtracts 15 from 195, and the choice 210 adds 15 to 195, so both use the wrong operation. The choice 12 is one too small, since 15 times 12 equals 180, not 195.

83. B — To find what was taken away, subtract the answer from the start: 91 minus 58 equals 33, and 91 minus 33 checks to 58. The choice 149 adds 91 and 58 together instead. The choice 43 is ten too high and the choice 34 is one too high, so neither one leaves 58 when taken from 91.

84. A — Multiplication undoes division, so 13 times 7 gives 91, and 91 divided by 7 checks back to 13. The choice 6 subtracts 7 from 13, and the choice 20 adds 7 to 13, so both use the wrong operation. The choice 84 is 12 times 7, one group too few, so it divides to 12 and not 13.

85. D — Try each sign. Thirteen times 6 equals 78, so times makes the statement true. Thirteen plus 6 equals 19, thirteen minus 6 equals 7, and thirteen divided by 6 is a little more than 2, so all three of those signs give answers far from 78. Only multiplication reaches 78, so it is the correct sign.

86. C — To find the divisor, divide 168 by 14, which gives 12, and 168 divided by 12 checks back to 14. The choice 154 subtracts 14 from 168, and the choice 182 adds 14 to 168, so both use the wrong operation. The choice 13 is close, but 168 divided by 13 is not a whole number.

87. A — Work backward in two steps. First take away the 13, since 90 minus 13 is 77. Then divide by 7 to find that 77 divided by 7 is 11, and 7 times 11 plus 13 checks back to 90. The choice 77 stops after one step, 103 adds 13 instead, and 10 gives 83.

88. B — Work backward in two steps. First undo the minus 15 by adding it, since 49 plus 15 is 64. Then divide by 8 to find that 64 divided by 8 is 8, and 8 times 8 minus 15 checks to 49. The choice 64 stops after one step, 34 subtracts 15 instead, and 7 gives 41.

89. B — First add the numbers on the right side, since 46 plus 50 is 96. Then 96 divided by 8 gives 12, and 12 times 8 checks back to 96. The choice 96 is the sum and not the missing number, while 11 gives 88 and 13 gives 104 when multiplied by 8, so neither makes the equation true.

90. D — First remove the 17, since 61 minus 17 is 44. The two equal blanks together make 44, so each one is half of 44, which is 22. Check: 22 plus 22 plus 17 equals 61. The choice 44 forgets to split between two blanks, 78 adds instead of subtracting, and 21 gives a total of 59.

91. A — Try each sign. Seventy-two divided by 9 equals 8, so divided by makes the statement true. Seventy-two plus 9 equals 81, seventy-two minus 9 equals 63, and seventy-two times 9 equals 648, which are all far from 8. Only division shrinks 72 down to 8, so it is the one correct sign.

92. C — The two blanks hold the same number, so we look for a number that multiplied by itself equals 196. Since 14 times 14 is 196, the answer is 14. The choice 98 is half of 196 and not a square root, while 13 times 13 is 169 and 15 times 15 is 225, so neither of those works.

93. B — Work backward in two steps. Take 9 from 25 to get 16, which is what 64 divided by the blank must equal. Then 64 divided by 4 gives 16, so the blank is 4. The choice 16 is the in-between number from the first step, 8 gives a total of 17, and 2 gives a total of 41.

94. A — Work backward through the brackets. First divide 85 by 5 to find that the bracket holds 17. Then the blank plus 8 equals 17, so the blank is 9, and 9 plus 8 times 5 gives 85. The choice 17 stops one step early, 25 adds 8 instead of subtracting, and 77 subtracts 8 from 85.

95. C — First take away 45 from 120 to get 75. Then 75 minus the blank must equal 38, so the blank is 75 minus 38, which is 37. Check: 120 minus 37 minus 45 is 38. The choice 75 stops before using the 38, the choice 83 adds instead of subtracting, and 47 leaves 28.

96. D — Three equal triangles total 57, so one triangle is 57 divided by 3, which equals 19. The question asks for triangle minus 6, so take 6 from 19 to get 13. The choice 19 is only the value of one triangle, 51 subtracts 6 from the total of 57, and 63 adds 6 to it.

97. D — Try each sign. Fifty-seven minus 19 equals 38, so minus makes the statement true. Fifty-seven plus 19 equals 76, fifty-seven times 19 equals 1083, and fifty-seven divided by 19 equals 3, so none of those three signs give 38. Only subtraction leaves exactly 38, so it is the correct sign.

98. A — Five groups of the number plus three groups of the same number make eight groups, so 8 times the blank equals 72. Dividing 72 by 8 gives 9. Check: 45 plus 27 is 72. The choice 8 is only the number of groups, 24 is 72 divided by 3, and 10 gives 80.

99. C — The numbers go up by 9 each time, since 38 plus 9 is 47, 47 plus 9 is 56, and 56 plus 9 is 65. Adding 9 to 65 gives 74. The choice 73 adds only 8, the choice 75 adds 10, and the choice 72 adds 7, so none of them keep the steady step of 9.

100. B — The numbers go down by 6 each time, since 97 minus 6 is 91, 91 minus 6 is 85, and 85 minus 6 is 79. Taking 6 from 79 gives 73. The choice 72 subtracts 7, the choice 74 subtracts only 5, and the choice 67 subtracts 12, so none of them keep the steady drop of 6.

101. C — Each number is double the one before it, since 13 times 2 is 26, 26 times 2 is 52, and 52 times 2 is 104. Doubling 104 gives 208. The choice 156 adds 52, which only fits a constant step, the choice 130 adds 26, and the choice 200 is close but does not follow the doubling rule.

102. B — The numbers go up by 13 each time, since 22 plus 13 is 35, 35 plus 13 is 48, and 48 plus 13 is 61. Adding 13 to 61 gives 74. The choice 73 adds only 12, the choice 75 adds 14, and the choice 87 adds 26, which is double the real step, so none keep the pattern.

103. A — Each number is half the one before it, since 720 divided by 2 is 360, 360 divided by 2 is 180, and 180 divided by 2 is 90. Half of 90 is 45. The choice 30 divides by 3, the choice 60 subtracts 30, and the choice 22 halves twice, so none of them follow the halving rule.

104. D — The numbers go down by 14 each time, since 95 minus 14 is 81, 81 minus 14 is 67, and 67 minus 14 is 53. Taking 14 from 53 gives 39. The choice 38 subtracts 15, the choice 40 subtracts 13, and the choice 25 subtracts 28, so none of them keep the steady drop of 14.

105. C — Each number is four times the one before it, since 5 times 4 is 20, 20 times 4 is 80, and 80 times 4 is 320. Multiplying 320 by 4 gives 1280. The choice 640 doubles 320, the choice 1600 multiplies by 5, and the choice 1000 is only close, so none fit.

106. A — The gaps grow by one each time: plus 2, plus 3, plus 4, plus 5. The next gap is plus 6, and 20 plus 6 is 26. The choice 25 adds only 5, repeating the last gap, the choice 27 adds 7, which skips ahead, and the choice 30 adds 10, which breaks the growing pattern.

107. D — The gaps grow by 2 each time: plus 1, plus 3, plus 5, plus 7. The next gap is plus 9, and 25 plus 9 is 34. The choice 32 adds 7, repeating the last gap, the choice 33 adds 8, and the choice 38 adds 13, so none of them follow the pattern of gaps going up by two.

108. B — The numbers go down by amounts that shrink: minus 10, minus 8, minus 6, minus 4. The next amount is minus 2, and 42 minus 2 is 40. The choice 38 subtracts 4, repeating the last step, the choice 39 subtracts 3, and the choice 36 subtracts 6, so none follow the shrinking pattern.

109. C — The rule repeats two steps: add 12, then subtract 6. Forty plus 12 is 52, minus 6 is 46, plus 12 is 58, minus 6 is 52, plus 12 is 64. The next step is to subtract 6, so 64 minus 6 is 58. The choice 76 adds 12 again, 70 adds 6, and 64 repeats the last number.

110. A — The gaps double each time: plus 2, plus 4, plus 8, plus 16. The next gap is plus 32, and 35 plus 32 is 67. The choice 51 adds only 16, repeating the last gap, the choice 65 adds 30, and the choice 69 adds 34, so neither of those fit the doubling gaps.

111. B — The rule repeats two steps: halve, then add 8. Half of 64 is 32, plus 8 is 40, half is 20, plus 8 is 28, half is 14. The next step is to add 8, so 14 plus 8 is 22. The choice 7 halves again, 28 repeats an earlier term, and 24 adds 10, so none of them fit.

112. D — Each number is double the one before it minus 3, since 8 times 2 minus 3 is 13, 13 times 2 minus 3 is 23, and 43 times 2 minus 3 is 83. Then 83 times 2 minus 3 is 163. The choice 166 forgets to subtract 3, 126 adds 43, and 160 subtracts 6.

113. D — The pattern repeats two steps: multiply by 3, then subtract 3. Five times 3 is 15, minus 3 is 12, times 3 is 36, minus 3 is 33, times 3 is 99. The next step is to subtract 3, giving 96. The choice 297 multiplies by 3 again, 102 adds 3, and 93 subtracts 6.

114. A — Two patterns are mixed together. The first, third, fifth, and seventh numbers are 31, 36, 41, 46, which go up by 5. The others, 90, 80, 70, go down by 10. Since the next spot belongs to the falling pattern, it is 70 minus 10, which is 60. The choice 51 is the next rising number.

115. B — Each number is triple the one before it plus 2, since 3 times 3 plus 2 is 11, 11 times 3 plus 2 is 35, and 35 times 3 plus 2 is 107. Then 107 times 3 plus 2 is 323. The choice 321 forgets to add 2, 325 adds 4, and 214 doubles 107.

116. C — Two patterns are mixed together. The first, third, fifth, and seventh numbers are 2, 6, 18, 54, which triple. The others, 50, 45, 40, go down by 5. Since the next spot belongs to the falling pattern, it is 40 minus 5, which is 35. The choice 162 is the next tripling number, and 30 skips ahead.

117. B — The numbers are multiplied by 2, then 3, then 4, then 5, so the multiplier grows by one each time. The next multiplier is 6, and 240 times 6 is 1440. The choice 1200 multiplies by 5 again, the choice 960 multiplies by 4, and the choice 1680 multiplies by 7, so none use 6.

118. C — Two patterns are mixed together. The first, third, fifth, and seventh numbers are 12, 17, 22, 27, which go up by 5. The others, 3, 6, 9, go up by 3. Since the next spot belongs to the second pattern, it is 9 plus 3, which is 12. The choice 32 is the next number of the first pattern.

119. A — In the top row, the star keeps its shape and its black shade but grows from small to large. Applying that same growth to the small white hexagon gives a large white hexagon. The small black hexagon changes only the shade, the large black hexagon changes size and shade, and the large white star changes the shape.

120. D — In the top row, the number of shapes goes from one to three while the shape and shade stay the same. The same change on one white square gives three white squares. Three black squares change the shade, three white circles change the shape, and two white squares give the wrong count of shapes.

121. C — In the top row, the circle grows from small to large and its shade turns from white to black. Applying both changes to the small black square gives a large white square. The large black square keeps the old shade, the small white square keeps the old size, and the large white circle changes the shape.

122. B — Across the top row, the white circle keeps its shape and shade but gains a black dot inside. The same change applied to the white square gives a white square with a black dot inside. The black square changes the shade, the white dot would be invisible, and the circle changes the shape of the figure.

123. A — In the top row, the triangle turns to face the opposite direction, from up to down, while its shade stays the same. Turning the striped triangle pointing left to the opposite direction makes it point right. Pointing left again shows no change, a white triangle changes the shade, and pointing up is only a quarter turn.

124. D — Each row counts upward one shape at a time, so the top row goes from one to two to three. The bottom row has one and two black diamonds, so the next figure shows three black diamonds. Three white diamonds change the shade, two black diamonds repeat the last figure, and three black circles change the shape.

125. C — In every row, all three figures are exactly alike, with the same shape and the same shade. The third row already has two gray hexagons, so the missing figure must be a gray hexagon too. A gray square changes the shape, while the black hexagon and the white hexagon change the shade, so each one breaks the rule.

126. A — In each column, the bottom figure has the same shape as the top figure but turns from white to black. The top figure in the last column is a white star, so the missing figure is a black star. The white star shows no change, the black circle changes the shape, and the gray star uses a new shade.

127. B — In the top row, the dot stays at the top and moves from the left corner to the right corner. The bottom row does the same along the bottom, so the dot lands in the bottom right corner of the circle. Bottom left shows no change, and the other two choices change the height or the shape.

128. D — In the top row, the arrow makes a quarter turn clockwise, since up becomes right. Turning the arrow pointing left a quarter turn clockwise makes it point up. Down would be a quarter turn the other way, left would be no turn at all, and right would be a half turn, so only up follows the same turn.

129. B — Each row and each column must hold one black, one white, and one gray diamond. The third row already has gray and black, so white is missing. A gray diamond or a black diamond would repeat a shade in the row, and a striped diamond is a shade that never appears in the grid.

130. D — The dot moves clockwise around the shape by one side each step: left, top, right, and then bottom. The bottom row starts one step later, with top and then right, so the next step puts the dot on the bottom side of the gray square. Left and top go the wrong way around, and the circle changes the shape.

131. C — In the top row, the number of shapes grows by three, from two to five, while the shape and shade stay the same. Adding three to four white circles gives seven small white circles. Seven black circles change the shade, six white circles add only two, and seven white squares change the shape of the figures.

132. A — Moving along any row, the arrow makes a quarter turn clockwise each time, and each row begins one turn after the row above. Down turns to left, and left turns a quarter turn to up. Down would repeat the start of the row, right would be a half turn from the previous figure, and left would show no turn.

133. A — In each row, the last figure has as many dots as the first two added together, since 2 plus 3 is 5 and 1 plus 4 is 5. In the third row, 4 plus 3 is 7, so 7 black dots completes it. Six dots misses by one, twelve dots multiplies 4 by 3, and one dot subtracts.

134. B — The three figures in every row are the same three, black circle, white square, and gray triangle, shifted one place each row, so each row and column holds all three. The third row has the gray triangle and black circle, so the white square is missing. The other choices mix a shape with a shade that was never paired together.

135. D — The top row has two changes at once: a quarter turn clockwise, since up becomes right, and a shade swap from black to white. Applying both to the white arrow pointing left gives a black arrow pointing up. The white arrow pointing up skips the shade swap, pointing down turns the wrong way, and pointing left skips the turn.

136. C — Going along any row, each figure has one more side than the one before it. The third row has a pentagon with five sides and a hexagon with six sides, so the next figure has seven sides. Six sides repeats the last figure, eight sides jumps too far, and five sides repeats the first figure of the row.

137. B — Every row counts up by one, but each row starts with one more shape than the row above. The third row begins at three, so it runs three, four, and five. Five gray triangles completes it. Four triangles repeat the last figure, six triangles skip a count, and five black triangles change the shade.

138. A — Each row grows in three ways at once: the count goes from one to two to three, the size goes from small to medium to large, and the shape and shade stay fixed. The third row has gray triangles, so the last figure shows three large gray triangles. The other choices have the wrong size, shade, or count.

139. C — Folding the sheet in half makes two layers of paper, so each punch goes through two layers and leaves two holes when the sheet is opened. Three punches leave 3 times 2, which is 6 holes. Three holes would count only the punches, four holes uses the wrong layers, and twelve holes would treat the fold as four layers.

140. D — An accordion fold with two zigzag creases stacks the strip into three layers, and the punch goes through every layer. When the strip is opened, each layer shows one hole, so there are three holes in all. One hole forgets the layers, two holes counts only two layers, and six holes doubles the correct count.

141. B — The diagonal fold makes two layers. Each hole away from the fold goes through both layers, so two punches make 2 times 2, or 4 holes. A hole exactly on the fold opens as only one hole. Together that is 4 plus 1, or 5. Three ignores the layers, four forgets the fold hole, and six doubles it.

142. C — Two folds make four layers of paper, and each punch goes through all four layers. Three punches leave 3 times 4, which is 12 holes when the sheet is opened. Six holes would count only two layers, nine holes would count three layers, and eight holes would come from the wrong number of punches, so only 12 holes fits.

143. D — Opening the sheet makes a mirror copy of the triangle on the other side of the crease. Two triangles that share a flat side join into one four-sided diamond. A single triangle forgets the mirror copy, two triangles with a gap would need the cut to be away from the crease, and a round hole needs a curved cut.

144. A — Opening the sheet makes a mirror copy of the half circle on the other side of the crease. Two half circles that share a straight side join to make one whole circle. A single half circle forgets the mirror copy, and a square or a triangle could not come from a curved cut, so only the whole circle fits.

145. D — The crease runs across the middle of the sheet, so the hole is mirrored top to bottom, giving two holes. Both stay near the right edge, one high and one low. One hole needs a punch on the crease. Two low holes ignore the mirror, and holes near the bottom edge use the wrong direction.

146. A — The crease is on the left side of the folded shape, and the open edges are on the right. A hole close to the open edge is mirrored across the crease, so the copy lands near the left edge. Both holes stay near the top. Holes near the middle would need a punch close to the crease.

147. C — The crease runs across the middle of the sheet, and the open edges are at the top. A hole close to the open edge is mirrored across the crease, so one copy is high and the other is low. Both stay near the left edge. Holes near the middle height would need a punch close to the crease.

148. B — Each hole away from the fold goes through two layers, so five punches make 5 times 2, or 10 holes. Each hole exactly on the fold opens as only one hole, so two such punches add 2 more. Together

that is 10 plus 2, or 12. Fourteen doubles everything, ten forgets the fold holes, and seven ignores the layers.

149. A — The first fold makes two layers, and the second fold doubles that to four layers. Each punch goes through all four layers, so two punches make 2 times 4, or 8 holes. Four holes counts only two layers, six holes does not match any count of layers, and sixteen holes would need two more folds.

150. C — The two creases meet at the center of the sheet, so the far corner of the folded square is a real corner of the sheet. Mirroring across both creases copies the hole into all four corners, giving four holes. Holes close together around the center would need a punch near the creases. Fewer holes ignore a fold.

151. D — The two creases meet at the center of the sheet. A hole punched just inside that corner is mirrored across both creases, so four holes appear in a small square around the center. Holes at the corners would need a punch far from the creases. One hole needs the punch exactly on the corner, and two holes ignore one fold.

152. B — Three folds double the layers three times, 2 times 2 times 2, so there are eight layers. Each punch goes through all eight layers, so two punches make 2 times 8, or 16 holes. Eight holes counts only one punch, six holes is not a possible count, and thirty-two holes would need sixteen layers.

153. B — Two folds make four layers, so each punch becomes four holes when the sheet is opened. Dividing the 20 holes by 4 gives 5 punches. Ten punches would make 40 holes, four punches would make 16, and twenty punches would make 80, so only five opens to exactly 20 holes when unfolded.

154. A — Two folds make four layers, so each of the two punches opens into four holes, making eight in all. Both folds go the same way, so the holes keep their heights and spread into even rows near the top and the bottom. All in the right half ignores the mirror copies. Four and six holes use the wrong layers.

155. D — The bottom edge of the folded square is the crease across the middle of the sheet, so the punch is near the middle height. Mirroring across it makes a close pair, and the left to right fold copies the pair across. A small square needs a punch near both creases, and corner holes need a faraway punch.

156. C — The corner where the two creases meet is the exact center of the sheet, and all four layers share that one point. A punch there cuts a single hole in the center. Four holes would need the punch away from the creases. Two holes would need it on only one crease, and three holes does not match any fold.

157. A — Each of the two holes away from every crease goes through four layers, so they make 2 times 4, or 8 holes. The hole on the first crease is doubled only by the second fold, so it makes 2 holes. Together that is 8 plus 2, or 10. Twelve treats the crease hole as four, and fourteen overcounts.

158. D — All three figures are black, while their shapes are all different. So the shade is the shared feature, and the best match is another black figure, the black star. The white star, the gray star, and the striped star are not black, so each one fails the shared feature that the first three have.

159. B — The shapes are different, but all three figures are large and white, so those two features are shared. A large white heart has both of them. The small white heart is the wrong size, and the large

black heart and the large gray heart are the wrong shade, so each of those fails one of the shared features.

160. C — The shapes change from figure to figure, but every figure is striped, so the stripes are what the first three share. A striped star is the only choice with stripes. The dotted star, the white star, and the black star are all stars that use some other shade or pattern, so none of them matches the first three.

161. B — Each of the first three figures has exactly four small shapes in a row, and only the kind of shape changes. Four small stars in a row follows that pattern. Five small stars has too many, three small stars has too few, and one large star has a single shape of a different size.

162. D — A square, a long rectangle, and a tilted diamond each have exactly four sides, so four sides is what they share. A kite also has four sides. The triangle has only three sides, the pentagon has five, and the hexagon has six, so none of those match the number of sides in the first three figures.

163. C — The shape and the shade change from figure to figure, but every figure points to the right, so the direction is what the three share. A white triangle pointing right matches that. The same triangle pointing left, up, or down would turn away from the direction that the first three figures all have, so each of them is wrong.

164. A — Every one of the first three figures is split into exactly two equal pieces, so that is the shared feature. A rectangle cut into two equal halves matches it. Three parts and four parts make too many pieces, and two unequal parts has the right number of pieces but the pieces are not equal, so those choices fail.

165. D — A circle, an oval, and a ring are all smooth and curved, with no corners at all. A smooth egg shape has the same smooth edge. The star has five sharp points, the rectangle has four corners, and the triangle has three corners, so each of those has corners that the first three figures do not have.

166. C — Every figure in the first three has one black dot inside a bigger shape, and only the outer shape changes. A pentagon with a black dot inside follows the same plan. A dot below the pentagon is outside it, an empty pentagon has no dot, and a black square inside is a square instead of a dot.

167. A — The outer shape changes, but each of the first three figures has exactly one straight line across it. A hexagon with one straight line across it keeps that feature. Two straight lines are too many, no lines are too few, and a curved line is not straight, so the other hexagons break what the first three have in common.

168. B — Each of the first three figures has a pair of matching shapes, with the small one on top of the large one. A small square above a large square follows that plan. The large square above a small square flips the order, the squares side by side change the position, and two equal squares have no small one.

169. D — Each of the first three figures has a black bottom half and a white top half. A star with a black bottom half and a white top half keeps that plan. Swapping the halves reverses the shading, a left and right split uses the wrong direction, and an all black star has no white half.

170. C — Every one of the first three figures has two black shapes and one white shape, all of the same kind. Two black stars and one white star has the same counts. One black star and two white stars swap the counts, two black stars and two white stars have too many shapes, and three black stars have no white shape.

171. B — In each of the first three figures, the outside shape is white and the small shape inside is black. A white star with a small black circle inside matches those shades and places. A black star with a white circle swaps the shades, the gray circle is a new shade, and a circle beside the star is outside.

172. A — The first three figures each show two matching shapes that just touch at a single point. Two stars that touch at exactly one point follows that plan. Overlapping stars share an area rather than a point, and stars that are far apart or have a small gap do not touch at all, so each of those breaks the shared feature.

173. C — The kinds of shapes change a lot, but each figure holds exactly six shapes: 3 plus 3, 2 plus 4, and 5 plus 1. Six hearts in a row also holds six shapes. Five hearts and four hearts have too few, and seven hearts has too many, so the total of six is the only shared feature.

174. D — In the first three figures, the number of dots matches the number of sides: 3 sides with 3 dots, 4 sides with 4 dots, and 5 sides with 5 dots. A hexagon has six sides, so it needs six dots. A hexagon with five or four dots has too few, and one with seven dots has too many.

175. B — Each of the first three figures has three matching shapes whose size grows from left to right. Three stars that get bigger from left to right follow the same plan. Stars that get smaller go the opposite way, stars that are all the same size show no growth, and a biggest star in the middle grows and then shrinks.

176. A — The numbers of sides are 4, 6, and 8, and each one is an even number. The next even number is 10, so a shape with ten sides belongs with them. Nine, seven, and five are all odd numbers, so shapes with nine, seven, or five sides break the pattern of even numbers that the first three share.