

# MIDDLE LEVEL SSAT PRACTICE TEST 1

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## Writing Sample

**Time – 25 Minutes**

**Directions:** Schools would like to get to know you better through an essay or story you write. Please select and respond to one of the two topics provided. If you choose Topic A, write a creative story. If you choose Topic B, write a personal essay.

**Topic A:** When the lights went out during the championship game, nobody expected what happened next.

**Topic B:** Describe someone who has taught you an important lesson without realizing it. What did you learn from observing this person, and how has it affected the way you live your life?

## Section 1: Quantitative

Time – 30 Minutes

25 Questions

**Directions:** Following each problem in this section, there are five suggested answers. Work each problem in your head or in the blank space provided. Then select the best answer.

1. What is the product of 7 and the sum of 8 and 5?

- A. 20
- B. 56
- C. 91
- D. 65
- E. 46

2. If  $n \div 4 = 12$ , then  $n =$

- A. 3
- B. 8
- C. 16
- D. 36
- E. 48

3. A number sequence follows the rule: subtract 5 from the previous number. If the sequence starts at 47, what is the 5th number?

- A. 22
- B. 27
- C. 32
- D. 37
- E. 42

4. What is the area of a triangle with base 14 and height 6?

- A. 42
- B. 20
- C. 84
- D. 21
- E. 40

5. If  $2x + 9 = 31$ , then  $x =$

- A. 20
- B. 40
- C. 10
- D. 11
- E. 22

6. A book has 360 pages. If Maria has read  $\frac{5}{6}$  of the book, how many pages has she read?

- A. 60
- B. 72
- C. 300
- D. 250
- E. 280

7. What is  $18 + 6 \times 3 - 10$ ?

- A. 14
- B. 62
- C. 72
- D. 54
- E. 26

8. A fair coin is flipped twice. What is the probability of getting heads both times?

- A.  $\frac{1}{2}$
- B.  $\frac{1}{4}$
- C.  $\frac{1}{3}$
- D.  $\frac{2}{4}$
- E.  $\frac{3}{4}$

9. Which of the following is equivalent to 0.45?

- A.  $\frac{9}{20}$
- B.  $\frac{4}{5}$
- C.  $\frac{1}{2}$
- D.  $\frac{45}{10}$
- E.  $\frac{9}{10}$

10. A rectangle has a perimeter of 40. If its length is 12, what is its width?

- A. 28
- B. 14
- C. 10
- D. 8
- E. 16

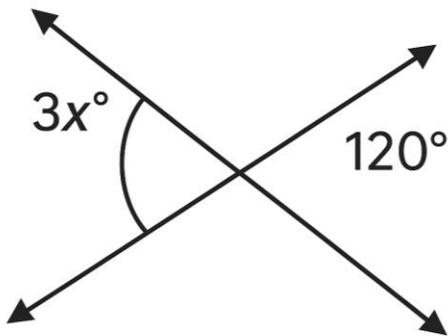
11. If  $5y - 15 = 10$ , then  $y =$

- A. 1
- B. 3
- C. 5
- D. 7
- E. 25

12. A store has 48 apples. If  $\frac{3}{8}$  of them are red and the rest are green, how many are green?

- A. 18
- B. 24
- C. 20
- D. 32
- E. 30

13. In the figure shown, what is the value of  $x$ ?



- A. 60
- B. 20
- C. 40
- D. 30
- E. 50

14. If  $a > 12$  and  $a < 18$ , which of the following could be the value of  $a$ ?

- A. 15
- B. 12
- C. 18
- D. 11
- E. 19

15. A car uses 3 gallons of gas to travel 90 miles. At this rate, how many gallons are needed to travel 120 miles?

- A. 30
- B. 40
- C. 3
- D. 4
- E. 5

16. What is  $\frac{7}{12} - \frac{3}{12}$ ?

- A.  $\frac{4}{24}$
- B.  $\frac{10}{12}$
- C.  $\frac{4}{12}$
- D.  $\frac{1}{3}$
- E.  $\frac{7}{3}$

17. Round 8,349 to the nearest hundred.

- A. 8,000
- B. 8,200
- C. 8,400
- D. 8,350
- E. 8,300

18. A pizza is cut into 8 equal slices. If 3 slices are eaten, what fraction of the pizza remains?

- A.  $\frac{3}{8}$
- B.  $\frac{5}{8}$
- C.  $\frac{1}{2}$
- D.  $\frac{3}{5}$
- E.  $\frac{2}{8}$

19. What is the least common multiple (LCM) of 8 and 12?

- A. 24
- B. 96
- C. 4
- D. 48
- E. 36

20. If the pattern continues: 5, 10, 20, 40, \_\_\_\_, what is the next number?

- A. 60
- B. 45
- C. 50
- D. 80
- E. 100

21. A cube has an edge length of 5. What is its volume?

- A. 15
- B. 25
- C. 125
- D. 50
- E. 100

22. What is 40% of 250?

- A. 40
- B. 50
- C. 80
- D. 90
- E. 100

23. If  $9 \times k = 108$ , then  $k =$

- A. 11
- B. 12
- C. 10
- D. 99
- E. 117

24. A number is divided by 6, then 8 is added. The result is 15. What is the number?

- A. 42
- B. 138
- C. 23
- D. 90
- E. 48

25. The ratio of cats to dogs at a shelter is 5:3. If there are 15 cats, how many dogs are there?

- A. 5
- B. 10
- C. 25
- D. 9
- E. 12

## Section 2: Reading

Time – 40 Minutes

40 Questions

**Directions:** Read each passage carefully and then answer the questions about it. For each question, decide on the basis of the passage which one of the choices best answers the question.

### Passage 1

Honeybees are remarkable insects that play a vital role in our food supply. These tiny workers pollinate about one-third of the crops humans eat, including apples, almonds, and blueberries. Without bees, many of our favorite foods would disappear from grocery stores.

A honeybee colony operates like a well-organized city. The queen bee lays all the eggs—up to 2,000 per day during peak season. Female worker bees, which make up most of the colony, have different jobs depending on their age. Young workers clean the hive and feed larvae. Middle-aged bees produce wax and build honeycomb. The oldest workers venture outside to collect nectar and pollen.

Male bees, called drones, have only one purpose: to mate with queens from other colonies. They don't collect food or defend the hive. When winter approaches and food becomes scarce, worker bees force the drones out of the hive to conserve resources.

Communication among bees is surprisingly sophisticated. When a forager discovers flowers, she returns to the hive and performs a "waggle dance" that tells other bees exactly where to find the food source. The angle of the dance indicates direction relative to the sun, while the duration shows distance.

Sadly, bee populations have declined dramatically in recent years due to pesticides, disease, and habitat loss. Scientists and farmers are working together to protect these essential pollinators before it's too late.

1. According to the passage, honeybees pollinate approximately what fraction of human crops?
  - A. one-fourth
  - B. one-third
  - C. one-half

- D. two-thirds
- E. three-fourths

2. The main job of drone bees is to

- A. collect nectar
- B. build honeycomb
- C. guard the hive
- D. mate with queens
- E. feed larvae

3. Worker bees are described as doing all of the following EXCEPT

- A. laying eggs
- B. cleaning the hive
- C. collecting pollen
- D. building honeycomb
- E. feeding young bees

4. The "waggle dance" communicates information about

- A. danger
- B. weather
- C. food location
- D. hive temperature
- E. enemy bees

5. The passage suggests that bee populations are threatened by

- A. cold weather only
- B. other insects
- C. lack of flowers

- D. too many drones
- E. pesticides and disease

## Passage 2

Marcus sat in the principal's office, his stomach churning. Through the window, he could see his artwork—or what was left of it—being swept up by the janitor. The massive papier-mâché globe he'd spent six weeks creating for the geography fair now lay in pieces across the hallway floor.

"It was an accident," Jake mumbled from the chair beside him. "I was just tossing the football and—"

"In the hallway?" Principal Rodriguez raised her eyebrows. "Where the sign clearly says 'No Ball Playing'?"

Marcus wanted to be angry. He wanted to yell at Jake, whose careless throw had destroyed his project the day before the fair. But when he looked at Jake's face—pale and genuinely miserable—the anger drained away. Jake hadn't meant to ruin anything. He'd just been foolish.

"Marcus worked very hard on that project," the principal continued. "Jake, what do you think would be fair?"

Jake swallowed hard. "I'll help him rebuild it. My dad has supplies in our garage. We can work all night if we have to."

Marcus hesitated. Working with Jake wasn't exactly his idea of fun. But looking at the determined expression on Jake's face, he slowly nodded. "Okay. But you're buying the pizza."

For the first time that afternoon, Principal Rodriguez smiled.

6. Marcus feels "his stomach churning" because he is
- A. hungry
  - B. upset about his destroyed project

- C. angry at the principal
- D. afraid of Jake
- E. sick with the flu

7. Jake destroyed Marcus's project by

- A. dropping it
- B. stepping on it
- C. painting over it
- D. throwing a football that hit it
- E. knocking over a table

8. Marcus decides not to stay angry at Jake because

- A. Jake appears genuinely sorry
- B. the principal told him not to be angry
- C. the project wasn't important
- D. he wanted to go home
- E. Jake was his best friend

9. Principal Rodriguez's smile at the end suggests she is

- A. amused by the boys
- B. pleased they can't do the project
- C. satisfied with how the boys resolved the situation
- D. relieved the meeting is over
- E. happy the globe was destroyed

10. The phrase "Working with Jake wasn't exactly his idea of fun" suggests that Marcus

- A. enjoys Jake's company
- B. often works with Jake

- C. thinks Jake is boring
- D. is excited to rebuild
- E. doesn't particularly like Jake

### Passage 3

The invention of the printing press in 1440 by Johannes Gutenberg changed the world forever. Before this innovation, books were copied by hand, making them extremely expensive and rare. A single Bible could take a monk over a year to copy, and only wealthy people or institutions could afford books.

Gutenberg's press used movable type—individual metal letters that could be arranged and rearranged to print different pages. This allowed printers to produce hundreds of copies of a book in the time it previously took to create one. The first book Gutenberg printed was the Bible, and about 180 copies were made. Today, fewer than 50 complete Gutenberg Bibles remain.

The printing press had enormous social impact. Books became affordable, and literacy rates soared as more people learned to read. Ideas spread faster than ever before. Scientists could share discoveries quickly. Religious reformers could distribute their ideas widely. The printing press helped spark both the Renaissance and the Protestant Reformation.

Today, we're experiencing a similar revolution with the internet and digital technology. Just as the printing press democratized information in the 1400s, the internet makes knowledge accessible to billions of people worldwide.

11. Before the printing press, books were

- A. printed quickly
- B. very expensive
- C. widely available
- D. written by machines
- E. free for everyone

12. Gutenberg's innovation used

- A. stone tablets

- B. paper only
- C. woodblocks
- D. movable metal type
- E. digital computers

13. Approximately how many complete Gutenberg Bibles exist today?

- A. fewer than 50
- B. 180
- C. hundreds
- D. thousands
- E. none

14. The passage states that the printing press helped cause

- A. World War I
- B. the Industrial Revolution
- C. the Renaissance
- D. the American Revolution
- E. the Ice Age

15. The author compares the printing press to

- A. the telephone
- B. the automobile
- C. the airplane
- D. the railroad
- E. the internet

16. The word "democratized" in the last paragraph most nearly means

- A. voted on

- B. made accessible to many people
- C. restricted
- D. complicated
- E. destroyed

#### **Passage 4**

Camouflage helps animals survive by allowing them to blend into their surroundings. Different species use different strategies. The arctic fox has white fur in winter to match the snow, then sheds this coat for brown fur in summer to match the tundra landscape. The chameleon can actively change its skin color within seconds to match its environment.

Some animals use disruptive coloration—patterns that break up their body outline. Zebras' stripes make it hard for predators to identify individual animals in a herd. Similarly, a giraffe's spots help it disappear among the dappled shadows of trees.

Mimicry is another survival strategy. The harmless milk snake has colored bands similar to the venomous coral snake, causing predators to avoid it. Some butterflies have evolved eyespots on their wings that resemble owl eyes, frightening away birds.

The most remarkable example might be the octopus, which can change both color and texture instantly. It can make its smooth skin bumpy to look like rocks or coral, and shift through colors ranging from red to brown to white in less than a second.

17. The passage is primarily about
- A. zebras only
  - B. dangerous animals
  - C. underwater creatures
  - D. animal camouflage strategies
  - E. arctic wildlife
18. The arctic fox survives by

- A. changing fur color seasonally
- B. remaining white year-round
- C. living underground
- D. eating only plants
- E. flying away from predators

19. According to the passage, zebra stripes help by

- A. attracting mates
- B. keeping them cool
- C. making individuals hard to distinguish
- D. scaring predators
- E. helping them run faster

20. Mimicry helps animals by

- A. making them larger
- B. helping them find food
- C. making them faster
- D. keeping them warm
- E. making them look dangerous

21. The octopus is called "the most remarkable example" because it can

- A. fly
- B. change both color and texture instantly
- C. live for centuries
- D. grow very large
- E. speak to other octopi

## Passage 5

Success is not final, failure is not fatal: it is the courage to continue that counts. Many of history's greatest achievers faced repeated rejection before achieving their dreams. Walt Disney was fired from a newspaper for "lacking imagination." Oprah Winfrey was demoted from her first television job because she was "unfit for TV." J.K. Rowling's first Harry Potter book was rejected by twelve publishers.

What separated these individuals from those who gave up? Persistence. They viewed failure not as a stop sign but as a learning opportunity. Each rejection taught them something valuable. Each setback made them stronger and more determined.

Research shows that people who succeed despite obstacles tend to have a "growth mindset." They believe abilities can be developed through effort and learning. When they fail, they think, "What can I learn from this?" rather than "I'm not good enough." This mindset transforms failure from something shameful into something useful.

The next time you face disappointment, remember: every expert was once a beginner, and every master was once a disaster. Your response to failure matters far more than the failure itself.

22. The main purpose of this passage is to

- A. criticize people who give up
- B. describe Walt Disney's life
- C. tell entertaining stories
- D. encourage persistence after failure
- E. explain how to become famous

23. According to the passage, J.K. Rowling's book was rejected

- A. twelve times
- B. never
- C. once
- D. hundreds of times
- E. by every publisher

24. People with a "growth mindset" believe that
- A. failure is permanent
  - B. talent is fixed at birth
  - C. abilities can be developed
  - D. success comes from luck
  - E. mistakes should be avoided
25. The phrase "every master was once a disaster" suggests that
- A. masters never fail
  - B. disasters can't be prevented
  - C. everyone starts badly
  - D. mastery requires no practice
  - E. even experts struggled at first
26. The author's tone in this passage is best described as
- A. angry
  - B. encouraging
  - C. sad
  - D. humorous
  - E. frightening

### **Passage 6**

Fossils are the preserved remains or traces of ancient organisms. Most fossils form when a dead organism is quickly buried by sediment like mud or sand. Over millions of years, minerals seep into the buried remains, gradually replacing the original material with rock.

Not all organisms become fossils. The conditions must be exactly right. Organisms with hard parts like shells, bones, or teeth fossilize more easily than soft-bodied creatures. This is why we have many fossil shells but few fossil jellyfish. Most organisms simply decay completely before fossilization can begin.

Scientists study fossils to learn about Earth's history and the evolution of life. Fossils show us creatures that lived millions of years ago, like dinosaurs and ancient sea life. By examining fossils in different rock layers, scientists can determine how old they are and how life changed over time. The fossil record is like a history book written in stone.

Sometimes fossils reveal surprising information. Fossils of tropical plants found in Antarctica prove that this frozen continent was once warm. Fossils of sea creatures on mountaintops show that these areas were once underwater.

27. Fossils most commonly form when organisms are

- A. eaten by predators
- B. exposed to sunlight
- C. preserved in ice
- D. quickly buried by sediment
- E. burned by fire

28. According to the passage, which type of organism fossilizes most easily?

- A. organisms with hard parts
- B. soft-bodied creatures
- C. jellyfish
- D. plants only
- E. bacteria

29. Scientists use fossils to

- A. predict the future
- B. make jewelry
- C. study Earth's history
- D. create new species
- E. control the weather

30. Fossils of tropical plants in Antarctica suggest that

- A. plants can survive freezing
- B. Antarctica never had plants
- C. scientists made a mistake
- D. modern plants came from Antarctica
- E. Antarctica was once warmer

31. The phrase "history book written in stone" is used to

- A. describe how heavy fossils are
- B. explain how scientists record data
- C. show that fossils preserve Earth's history
- D. suggest fossils are unreadable
- E. compare fossils to libraries

### **Passage 7**

Benjamin Banneker was born in 1731 in Maryland as a free African American—a rarity in colonial America. With almost no formal education, he taught himself advanced mathematics and astronomy by borrowing books and studying at night.

In his early twenties, Banneker constructed a wooden clock that kept accurate time for over 50 years. He had only seen a pocket watch once, yet he carved each gear and mechanism from memory. This clock made him famous throughout the region.

Later, Banneker created accurate astronomical calculations and published almanacs that predicted solar and lunar eclipses, tides, and weather patterns. His almanacs were widely respected and proved that African Americans possessed the same intellectual abilities as whites—a radical idea at the time.

In 1791, Banneker was appointed to the surveying team that planned Washington, D.C. When the lead architect suddenly quit and took all the plans, Banneker recreated the entire city layout from memory.

Banneker also wrote to Thomas Jefferson, challenging him to reconcile his words about equality in the Declaration of Independence with his ownership of enslaved people. Though Jefferson responded respectfully, he never freed his slaves. Banneker spent his life proving through achievement what should have been obvious: that genius knows no race.

32. Benjamin Banneker is best described as

- A. a wealthy plantation owner
- B. an enslaved person who escaped
- C. a person with little formal education
- D. a self-taught scholar
- E. a famous politician

33. Banneker's wooden clock was remarkable because

- A. it was made from memory after seeing a watch once
- B. it cost millions of dollars
- C. it was the first clock ever made
- D. it was powered by electricity
- E. it never worked properly

34. Banneker's almanacs were significant because they

- A. made him wealthy
- B. predicted the Civil War
- C. demonstrated African American intellectual ability
- D. were written in multiple languages
- E. contained fictional stories

35. When the architect quit, Banneker

- A. gave up on the project
- B. hired a replacement

- C. moved to another city
- D. complained to officials
- E. recreated the city plans from memory

36. Banneker wrote to Thomas Jefferson to

- A. ask for a job
- B. point out his hypocrisy about equality
- C. request money
- D. praise his leadership
- E. invite him to Maryland

### Passage 8

When you drop a ball, it falls to the ground. When you jump, you come back down. These everyday events happen because of gravity, one of the fundamental forces in the universe. Sir Isaac Newton discovered the law of gravity in the 1600s, supposedly after watching an apple fall from a tree.

Newton realized that the same force pulling the apple down also keeps the Moon orbiting Earth and Earth orbiting the Sun. Gravity is an attractive force between all objects that have mass. The more massive an object, the stronger its gravitational pull. Earth's gravity is much stronger than the Moon's because Earth has more mass.

Gravity affects everything in the universe, from falling leaves to the formation of galaxies. Without gravity, planets wouldn't orbit stars, and stars wouldn't form at all. We'd float off into space instead of staying firmly planted on Earth's surface.

Interestingly, you have gravity too! Your body pulls on other objects, but the force is so small you can't feel it. Only massive objects like planets and stars have enough gravity to noticeably affect other things.

37. According to the passage, Newton supposedly discovered gravity after

- A. visiting the Moon
- B. reading ancient books

- C. performing experiments
- D. watching an apple fall
- E. traveling to other countries

38. Gravity is described as an attractive force between

- A. all objects with mass
- B. planets only
- C. living things only
- D. magnetic objects
- E. light particles

39. The Moon's gravity is weaker than Earth's because

- A. the Moon is farther away
- B. the Moon moves faster
- C. the Moon has less mass
- D. the Moon is older
- E. the Moon has no atmosphere

40. Without gravity, the passage suggests that

- A. we would weigh more
- B. planets wouldn't orbit stars
- C. the universe would be brighter
- D. time would move faster
- E. seasons wouldn't exist

## Section 3: Verbal

Time – 30 Minutes

60 Questions

**Directions:** This section consists of two different types of questions. There are directions and a sample question for each type.

### SYNONYMS (Questions 1-30)

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**Directions:** Each question consists of one word followed by five words or phrases. Select the word or phrase whose meaning is closest to the word in capital letters.

1. FEEBLE:

- A. strong
- B. loud
- C. bright
- D. weak
- E. happy

2. THRIVE:

- A. fail
- B. flourish
- C. shrink
- D. worry
- E. hide

3. PROMPT:

- A. late
- B. slow
- C. lazy

D. tired

E. quick

4. VAST:

- A. enormous
- B. tiny
- C. narrow
- D. short
- E. thin

5. DREAD:

- A. love
- B. enjoy
- C. fear
- D. want
- E. need

6. CLUMSY:

- A. graceful
- B. swift
- C. elegant
- D. awkward
- E. smooth

7. BRISK:

- A. slow
- B. lively
- C. dull
- D. tired
- E. weak

8. ABANDON:

- A. keep
- B. hold
- C. save
- D. protect
- E. desert

9. FRIGID:

- A. freezing
- B. warm
- C. hot
- D. mild
- E. comfortable

10. TRANQUIL:

- A. noisy
- B. busy
- C. calm
- D. chaotic
- E. loud

11. AMPLE:

- A. scarce
- B. little
- C. small
- D. plenty
- E. none

12. GRASP:

- A. release
- B. seize
- C. drop
- D. throw
- E. lose

13. HOLLOW:

- A. full
- B. solid
- C. heavy
- D. thick
- E. empty

14. SUMMIT:

- A. top
- B. bottom
- C. middle
- D. side
- E. edge

15. KEEN:

- A. dull
- B. boring
- C. eager
- D. tired
- E. lazy

16. VAGUE:

- A. clear
- B. obvious
- C. bright
- D. unclear
- E. sharp

17. RUIN:

- A. build
- B. destroy
- C. create
- D. make
- E. construct

18. SCARCE:

- A. common
- B. frequent
- C. many
- D. abundant
- E. rare

19. BOLD:

- A. brave
- B. shy
- C. afraid
- D. timid
- E. scared

20. STURDY:

- A. weak
- B. fragile
- C. strong
- D. delicate
- E. flimsy

21. GLEAM:

- A. darken
- B. fade
- C. dim
- D. shine
- E. hide

22. FRAIL:

- A. strong
- B. weak
- C. sturdy
- D. solid
- E. firm

23. SOAR:

- A. fall
- B. drop
- C. sink
- D. descend
- E. rise

24. CUNNING:

- A. clever
- B. stupid
- C. foolish
- D. dumb
- E. ignorant

25. MOIST:

- A. dry
- B. parched
- C. damp
- D. arid
- E. dusty

26. ANCIENT:

- A. new
- B. modern
- C. recent
- D. old
- E. current

27. MOCK:

- A. praise
- B. ridicule
- C. admire
- D. respect
- E. honor

28. VAIN:

- A. humble
- B. modest
- C. shy
- D. quiet
- E. conceited

29. FOE:

- A. enemy
- B. friend
- C. ally
- D. partner
- E. companion

30. GRIM:

- A. happy
- B. cheerful
- C. harsh

D. pleasant

E. joyful

### **ANALOGIES (Questions 31-60)**

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**Directions:** The following questions ask you to find relationships between words. For each question, select the answer choice that best completes the meaning of the sentence.

31. Hungry is to stomach as

- A. happy is to face
- B. tired is to eyes
- C. cold is to hands
- D. thirsty is to throat
- E. angry is to heart

E. skin is to human

32. Sail is to boat as

- A. tire is to car
- B. wing is to airplane
- C. wheel is to bicycle
- D. propeller is to helicopter
- E. engine is to train

34. Chef is to kitchen as

- A. mechanic is to garage
- B. teacher is to student
- C. doctor is to patient
- D. pilot is to passenger
- E. farmer is to crop

33. Bark is to tree as

- A. root is to plant
- B. petal is to flower
- C. leaf is to branch
- D. seed is to fruit

35. Dawn is to dusk as

- A. morning is to afternoon
- B. day is to week
- C. sunrise is to sunset
- D. noon is to midnight
- E. spring is to fall

36. Whisper is to yell as

- A. walk is to run
- B. talk is to speak

- C. listen is to hear
- D. tiptoe is to march
- E. mumble is to chat

37. Carpenter is to wood as
- A. painter is to brush
  - B. sculptor is to stone
  - C. writer is to pen
  - D. musician is to instrument
  - E. teacher is to student

38. Chill is to freeze as
- A. warm is to hot
  - B. cool is to cold
  - C. heat is to burn
  - D. melt is to solid
  - E. simmer is to boil

39. Scales is to justice as
- A. flag is to country
  - B. crown is to queen
  - C. badge is to police
  - D. uniform is to soldier
  - E. gavel is to judge

40. Lens is to glasses as
- A. dial is to clock
  - B. page is to book

- C. screen is to computer
- D. key is to piano
- E. string is to guitar

41. Paw is to cat as
- A. wing is to bird
  - B. fin is to fish
  - C. tail is to dog
  - D. hoof is to horse
  - E. shell is to turtle

42. Rehearse is to play as
- A. study is to test
  - B. practice is to game
  - C. exercise is to sport
  - D. train is to race
  - E. prepare is to exam

43. Acorn is to mighty as
- A. seed is to plant
  - B. egg is to bird
  - C. tadpole is to frog
  - D. caterpillar is to moth
  - E. spark is to fire

44. Quench is to thirst as
- A. satisfy is to hunger
  - B. cure is to disease

- C. heal is to wound
- D. solve is to problem
- E. answer is to question

45. Transparent is to glass as

- A. hard is to stone
- B. soft is to pillow
- C. opaque is to wood
- D. smooth is to silk
- E. rough is to sandpaper

46. Constellation is to stars as

- A. forest is to trees
- B. ocean is to water
- C. mountain is to rocks
- D. archipelago is to islands
- E. desert is to sand

47. Palette is to painter as

- A. canvas is to artist
- B. keyboard is to writer
- C. stage is to actor
- D. instrument is to musician
- E. camera is to photographer

48. Drought is to water as

- A. storm is to rain
- B. flood is to river

C. wind is to air

D. heat is to sun

E. famine is to food

49. Rung is to ladder as

- A. step is to staircase
- B. floor is to building
- C. brick is to wall
- D. tile is to roof
- E. plank is to deck

50. Conductor is to orchestra as

- A. teacher is to classroom
- B. captain is to team
- C. director is to actors
- D. president is to country
- E. judge is to courtroom

51. Lens is to focus as

- A. mirror is to reflect
- B. window is to open
- C. door is to close
- D. prism is to separate
- E. glass is to break

52. Curious is to investigate as

- A. hungry is to eat
- B. tired is to sleep

- C. thirsty is to drink
- D. happy is to smile
- E. angry is to yell

53. Map is to navigate as

- A. compass is to direct
- B. ruler is to measure
- C. clock is to tell time
- D. calendar is to schedule
- E. recipe is to cook

54. Rough is to sandpaper as

- A. smooth is to glass
- B. hard is to rock
- C. soft is to cotton
- D. sharp is to knife
- E. dull is to pencil

55. Hibernate is to winter as

- A. migrate is to summer
- B. bloom is to spring
- C. migrate is to season
- D. sleep is to night
- E. wake is to morning

56. Stubborn is to mule as

- A. fast is to cheetah
- B. slow is to turtle

C. smart is to owl

D. wise is to owl

E. strong is to ox

57. Ignite is to extinguish as

- A. start is to stop
- B. begin is to end
- C. open is to close
- D. rise is to fall
- E. enter is to exit

58. Petal is to flower as

- A. leaf is to tree
- B. branch is to trunk
- C. root is to soil
- D. stem is to plant
- E. feather is to bird

59. Telescope is to astronomer as

- A. microscope is to biologist
- B. stethoscope is to doctor
- C. thermometer is to nurse
- D. calculator is to mathematician
- E. compass is to navigator

60. Bitter is to lemon as

- A. sour is to lime
- B. sweet is to sugar

C. salty is to ocean

D. spicy is to pepper

E. bland is to water

## Section 4: Quantitative

Time – 30 Minutes

25 Questions

**Directions:** Following each problem in this section, there are five suggested answers. Work each problem in your head or in the blank space provided. Then select the best answer.

1. If 8 books cost \$72, how much do 3 books cost?

- A. \$24
- B. \$27
- C. \$21
- D. \$9
- E. \$18

2. What is the next number in the pattern: 80, 40, 20, 10, \_\_\_?

- A. 0
- B. 8
- C. 15
- D. 5
- E. 2

3. If  $x + 15 = 42$ , then  $x =$

- A. 27
- B. 57
- C. 37
- D. 17
- E. 15

4. A square has a perimeter of 48. What is its area?

- A. 12
- B. 96
- C. 144
- D. 24
- E. 192

5. What is  $\frac{3}{8} + \frac{1}{8}$ ?

- A.  $\frac{4}{16}$
- B.  $\frac{3}{8}$
- C.  $\frac{2}{8}$
- D.  $\frac{1}{4}$
- E.  $\frac{1}{2}$

6. If  $7m = 91$ , then  $m =$

- A. 12
- B. 13
- C. 14
- D. 84
- E. 98

7. A bag contains 6 red marbles and 9 blue marbles. What is the probability of selecting a red marble?

- A.  $\frac{9}{15}$
- B.  $\frac{6}{9}$
- C.  $\frac{1}{2}$
- D.  $\frac{6}{15}$
- E.  $\frac{2}{3}$

8. What is 60% of 150?

- A. 90
- B. 60
- C. 100
- D. 75
- E. 120

9. Round 5,678 to the nearest thousand.

- A. 5,000
- B. 5,700
- C. 6,000
- D. 5,600
- E. 5,680

10. If a pattern continues: 3, 9, 27, 81, \_\_\_\_, what is the next number?

- A. 162
- B. 108
- C. 324
- D. 135
- E. 243

11. A rectangle has a length of 15 and a width of 8. What is its perimeter?

- A. 23
- B. 46
- C. 120
- D. 30
- E. 60

12. What is the greatest common factor (GCF) of 20 and 32?

- A. 2
- B. 8
- C. 10
- D. 4
- E. 16

13. If  $4x + 6 = 38$ , then  $x =$

- A. 8
- B. 11
- C. 32
- D. 9
- E. 7

14. A store sells pencils for \$0.25 each. How much do 12 pencils cost?

- A. \$12.00
- B. \$2.50
- C. \$3.00
- D. \$3.50
- E. \$4.00

15. What is  $5^2 \times 2$ ?

- A. 100
- B. 52
- C. 20
- D. 25
- E. 50

16. If  $a < 20$  and  $a > 15$ , which could be the value of  $a$ ?

- A. 15
- B. 17
- C. 20
- D. 14
- E. 21

17. The ratio of dogs to cats at a shelter is 4:5. If there are 20 dogs, how many cats are there?

- A. 16
- B. 20
- C. 24
- D. 25
- E. 30

18. What is  $\frac{2}{5}$  of 35?

- A. 14
- B. 7
- C. 21
- D. 10
- E. 28

19. A triangle has two angles measuring  $45^\circ$  and  $60^\circ$ . What is the measure of the third angle?

- A.  $105^\circ$
- B.  $90^\circ$
- C.  $75^\circ$
- D.  $85^\circ$
- E.  $80^\circ$

20. If the pattern continues: 100, 95, 90, 85, \_\_\_\_, what is the next number?

- A. 75
- B. 84
- C. 70
- D. 90
- E. 80

21. What is the least common multiple (LCM) of 5 and 15?

- A. 5
- B. 15
- C. 75
- D. 30
- E. 45

22. A pizza is cut into 12 equal slices. If 5 slices are eaten, what fraction remains?

- A.  $\frac{5}{12}$
- B.  $\frac{1}{2}$
- C.  $\frac{2}{3}$
- D.  $\frac{7}{12}$
- E.  $\frac{5}{7}$

23. If  $6 + y = 18$ , then  $2y =$

- A. 24
- B. 12
- C. 6
- D. 36
- E. 18

24. What is 35% of 80?

A. 35

B. 24

C. 28

D. 32

E. 20

25. A number is multiplied by 4, then 7 is added. The result is 35. What is the number?

A. 8

B. 11

C. 6

D. 10

E. 7

# ANSWERS AND EXPLANATIONS

## Quantitative

**1. C: 91** - The phrase "product of 7 and the sum of 8 and 5" requires two steps. First, find the sum:  $8 + 5 = 13$ . Then find the product (multiply):  $7 \times 13 = 91$ . The word "product" always means multiplication, and "sum" means addition. Always perform operations in parentheses first, so think of this as  $7 \times (8 + 5)$ .

**2. E: 48** - Solve the equation  $n \div 4 = 12$  by multiplying both sides by 4:  $n = 12 \times 4 = 48$ . Division and multiplication are inverse operations, so to undo division by 4, multiply by 4. Check your answer:  $48 \div 4 = 12 \checkmark$

**3. B: 27** - Starting at 47, subtract 5 repeatedly to find each term. 1st number: 47. 2nd number:  $47 - 5 = 42$ . 3rd number:  $42 - 5 = 37$ . 4th number:  $37 - 5 = 32$ . 5th number:  $32 - 5 = 27$ . This is an arithmetic sequence with a common difference of  $-5$ .

**4. A: 42** - The area of a triangle equals  $(\text{base} \times \text{height}) \div 2$ . With base 14 and height 6:  $\text{Area} = (14 \times 6) \div 2 = 84 \div 2 = 42$  square units. You can also write the formula as  $A = \frac{1}{2}bh$ . A triangle's area is always half the area of a rectangle with the same base and height.

**5. D: 11** - Solve  $2x + 9 = 31$  in two steps. First, subtract 9 from both sides:  $2x = 22$ . Second, divide both sides by 2:  $x = 11$ . Check:  $2(11) + 9 = 22 + 9 = 31 \checkmark$  Always undo addition/subtraction before multiplication/division.

**6. C: 300** - To find  $\frac{5}{6}$  of 360, multiply:  $(\frac{5}{6}) \times 360$ . Divide 360 by 6 first:  $360 \div 6 = 60$ . Then multiply by 5:  $60 \times 5 = 300$  pages. Maria has read 300 pages, leaving 60 pages ( $\frac{1}{6}$  of the book) unread.

**7. E: 26** - Follow the order of operations (PEMDAS). Multiply first:  $6 \times 3 = 18$ . Then work left to right with addition and subtraction:  $18 + 18 = 36$ , then  $36 - 10 = 26$ . Don't work strictly left to right—multiplication must come before addition.

**8. B:  $\frac{1}{4}$**  - For independent events, multiply the individual probabilities. First flip:  $P(\text{heads}) = \frac{1}{2}$ . Second flip:  $P(\text{heads}) = \frac{1}{2}$ . Both heads:  $(\frac{1}{2}) \times (\frac{1}{2}) = \frac{1}{4}$ . You can also list all outcomes: HH, HT, TH, TT—only 1 out of 4 outcomes is HH.

**9. A:  $\frac{9}{20}$**  - Convert 0.45 to a fraction:  $0.45 = \frac{45}{100}$ . Simplify by dividing both numerator and denominator by their GCF, which is 5:  $45 \div 5 = 9$  and  $100 \div 5 = 20$ , giving  $\frac{9}{20}$ . Check:  $9 \div 20 = 0.45 \checkmark$

**10. D: 8** - The perimeter formula for a rectangle is  $P = 2(\text{length} + \text{width})$ . Given  $P = 40$  and  $\text{length} = 12$ :  $40 = 2(12 + \text{width})$ . Divide both sides by 2:  $20 = 12 + \text{width}$ . Subtract 12:  $\text{width} = 8$ . Check:  $2(12 + 8) = 2(20) = 40 \checkmark$

**11. C: 5** - Solve  $5y - 15 = 10$  in two steps. Add 15 to both sides:  $5y = 25$ . Divide both sides by 5:  $y = 5$ . Check:  $5(5) - 15 = 25 - 15 = 10 \checkmark$  Remember to undo subtraction before division.

**12. E: 30** - If  $\frac{3}{8}$  are red, then the remaining fraction is green. Total parts: 8. Red parts: 3. Green parts:  $8 - 3 = 5$ . So  $\frac{5}{8}$  are green:  $(\frac{5}{8}) \times 48 = (48 \div 8) \times 5 = 6 \times 5 = 30$  green apples. Alternatively, find red first (18), then subtract:  $48 - 18 = 30$ .

**13. B: 20** - When two lines intersect, adjacent angles are supplementary (sum to  $180^\circ$ ), and vertical angles are equal. The angle labeled  $3x^\circ$  and the  $120^\circ$  angle are supplementary because they're on a straight line. Set up the equation:  $3x + 120 = 180$ . Subtract 120:  $3x = 60$ . Divide by 3:  $x = 20$ . The angle  $3x$  equals  $60^\circ$ .

**14. A: 15** - The compound inequality  $a > 12$  and  $a < 18$  means  $a$  must be greater than 12 AND less than 18 simultaneously. Check each choice: 15 satisfies both conditions ( $15 > 12 \checkmark$  and  $15 < 18 \checkmark$ ). Choice B (12) doesn't work because  $a$  must be greater than 12, not equal to it. Choice C (18) doesn't work because  $a$  must be less than 18.

**15. D: 4** - Set up a proportion: 3 gallons/90 miles =  $x$  gallons/120 miles. Cross-multiply:  $3 \times 120 = 90 \times x$ , so  $360 = 90x$ . Divide by 90:  $x = 4$  gallons. Another method: Find miles per gallon ( $90 \div 3 = 30$  mpg), then divide 120 by 30 to get 4 gallons.

**16. C:  $\frac{4}{12}$**  - When subtracting fractions with the same denominator, keep the denominator and subtract the numerators:  $\frac{7}{12} - \frac{3}{12} = \frac{(7 - 3)}{12} = \frac{4}{12}$ . This can be simplified to  $\frac{1}{3}$  by dividing both numerator and denominator by 4, but  $\frac{4}{12}$  is the answer shown in the choices.

**17. E: 8,300** - When rounding to the nearest hundred, look at the tens digit. In 8,349, the tens digit is 4. Since  $4 < 5$ , round down: keep the hundreds digit as 3, making the answer 8,300. If the tens digit were 5 or greater, you would round up to 8,400.

**18. B:  $\frac{5}{8}$**  - If 3 slices out of 8 are eaten, then 5 slices remain. The fraction remaining is  $\frac{5}{8}$ . Don't confuse the fraction eaten ( $\frac{3}{8}$ ) with the fraction remaining ( $\frac{5}{8}$ ). Always check that the numerator represents what the question asks for.

**19. A: 24** - The LCM is the smallest number both 8 and 12 divide into evenly. List multiples: 8: 8, 16, 24, 32... and 12: 12, 24, 36... The first common multiple is 24. Verify:  $24 \div 8 = 3 \checkmark$  and  $24 \div 12 = 2 \checkmark$

**20. D: 80** - Examine the pattern: 5 to 10 is  $\times 2$ , 10 to 20 is  $\times 2$ , 20 to 40 is  $\times 2$ . Each number doubles to get the next. This is a geometric sequence with a common ratio of 2. To find the next number:  $40 \times 2 = 80$ .

**21. C: 125** - The volume of a cube equals edge  $\times$  edge  $\times$  edge (or edge<sup>3</sup>). With edge length 5: Volume =  $5 \times 5 \times 5 = 125$  cubic units. You can also write this as  $5^3 = 125$ . A cube has all edges equal length, so all three dimensions are the same.

**22. E: 100** - To find 40% of 250, multiply:  $0.40 \times 250 = 100$ . Mental math method: 10% of 250 is 25, so 40% is 4 times that:  $4 \times 25 = 100$ . Alternatively, think of 40% as  $\frac{2}{5}$ :  $(\frac{2}{5}) \times 250 = 100$ .

**23. B: 12** - Solve  $9 \times k = 108$  by dividing both sides by 9:  $k = 108 \div 9 = 12$ . Check:  $9 \times 12 = 108 \checkmark$  You can also think "9 times what number equals 108?" and use division or your multiplication facts.

**24. A: 42** - Work backwards from the result. If the result is 15 after adding 8, then before adding 8 the value was  $15 - 8 = 7$ . If dividing by 6 gave 7, the original number was  $7 \times 6 = 42$ . Check:  $42 \div 6 = 7$ , then  $7 + 8 = 15$  ✓

**25. D: 9** - The ratio 5:3 means for every 5 cats, there are 3 dogs. If there are 15 cats, find how many groups of 5:  $15 \div 5 = 3$  groups. Each group has 3 dogs, so total dogs =  $3 \times 3 = 9$ . You can also set up a proportion:  $5/3 = 15/x$ , cross-multiply:  $5x = 45$ , so  $x = 9$ .

## Reading

**1. B: one-third** - The passage explicitly states in the first paragraph: "These tiny workers pollinate about one-third of the crops humans eat." This is a direct fact stated clearly in the passage. The fraction one-third is specifically mentioned, not one-fourth (A), one-half (C), or any other fraction.

**2. D: mate with queens** - Paragraph 3 directly states: "Male bees, called drones, have only one purpose: to mate with queens from other colonies." The passage emphasizes this is their sole function—they don't collect nectar (A), build honeycomb (B), guard the hive (C), or feed larvae (E).

**3. A: laying eggs** - This is an EXCEPT question, so we're looking for what worker bees DON'T do. The passage states that "The queen bee lays all the eggs," not the workers. The passage confirms workers do clean the hive (B), collect pollen (C), build honeycomb (D), and feed larvae (E). Only egg-laying is exclusive to the queen.

**4. C: food location** - Paragraph 4 explains: "When a forager discovers flowers, she returns to the hive and performs a 'waggle dance' that tells other bees exactly where to find the food source." The dance communicates direction and distance to food, not danger (A), weather (B), temperature (D), or enemies (E).

**5. E: pesticides and disease** - The final paragraph states: "bee populations have declined dramatically in recent years due to pesticides, disease, and habitat loss." This directly identifies pesticides and disease as threats. Cold weather (A) isn't mentioned as a threat, and the other options aren't supported by the passage.

**6. B: upset about his destroyed project** - The phrase "stomach churning" indicates strong emotion. The context—Marcus seeing his destroyed artwork being swept up—clearly shows he's upset about his project. He's not hungry (A), the principal hasn't done anything to anger him (C), he's not afraid of Jake (D), and there's no mention of illness (E).

**7. D: throwing a football that hit it** - Jake admits: "I was just tossing the football and—" and the principal asks, "In the hallway?" This clearly indicates Jake threw a football that destroyed the project. The passage doesn't mention dropping (A), stepping on (B), painting over (C), or knocking over a table (E).

**8. A: Jake appears genuinely sorry** - The passage states: "But when he looked at Jake's face—pale and genuinely miserable—the anger drained away." Marcus's anger disappears because he recognizes Jake's

genuine remorse. The principal didn't tell him not to be angry (B), the project was important (C), and Jake wasn't his best friend (E).

**9. C: satisfied with how the boys resolved the situation** - The principal smiles after Jake offers to help rebuild and Marcus agrees. This smile indicates approval of their resolution. She's not merely amused (A), doesn't want them to fail (B), and isn't happy about the destruction (E).

**10. E: doesn't particularly like Jake** - The phrase "wasn't exactly his idea of fun" suggests reluctance or lack of enthusiasm about working with Jake. This indicates Marcus doesn't particularly enjoy Jake's company, not that he enjoys it (A) or is excited (D). The phrase suggests mild dislike or disinterest, not that Jake is boring (C).

**11. B: very expensive** - The passage states in paragraph 1: "Before this innovation, books were copied by hand, making them extremely expensive and rare." Books were not printed quickly (A), widely available (C), or free (E), and machines didn't exist then (D).

**12. D: movable metal type** - Paragraph 2 explicitly explains: "Gutenberg's press used movable type—individual metal letters that could be arranged and rearranged to print different pages." The passage doesn't mention stone tablets (A), woodblocks (C), or computers (E), and "paper only" (B) isn't the innovation.

**13. A: fewer than 50** - The passage states: "Today, fewer than 50 complete Gutenberg Bibles remain." This is directly stated. About 180 (B) were originally made, but fewer than 50 remain today. The other numbers aren't supported by the passage.

**14. C: the Renaissance** - Paragraph 3 states: "The printing press helped spark both the Renaissance and the Protestant Reformation." The Renaissance is explicitly mentioned as being influenced by the printing press. World War I (A), the Industrial Revolution (B), the American Revolution (D), and the Ice Age (E) are not mentioned.

**15. E: the internet** - The final paragraph draws a direct comparison: "Just as the printing press democratized information in the 1400s, the internet makes knowledge accessible to billions of people worldwide." The author compares the printing press's impact to the internet's impact, not to other inventions listed.

**16. B: made accessible to many people** - In context, "democratized" means the printing press made information available to ordinary people, not just the wealthy elite. "Democratize" means to make something accessible to everyone, not to vote on it (A), restrict it (C), complicate it (D), or destroy it (E).

**17. D: animal camouflage strategies** - The passage systematically discusses various camouflage methods: color-changing (arctic fox, chameleon), disruptive coloration (zebras, giraffes), mimicry (milk snakes, butterflies), and texture changes (octopus). This comprehensive coverage of camouflage strategies makes D the best answer. The passage isn't limited to zebras (A), dangerous animals (B), underwater creatures (C), or arctic wildlife (E).

**18. A: changing fur color seasonally** - The passage explicitly states: "The arctic fox has white fur in winter to match the snow, then sheds this coat for brown fur in summer to match the tundra landscape."

This describes seasonal color change. The fox doesn't remain white year-round (B), live underground (C), eat only plants (D), or fly (E).

**19. C: making individuals hard to distinguish** - Paragraph 2 explains: "Zebras' stripes make it hard for predators to identify individual animals in a herd." The stripes create confusion about where one zebra ends and another begins. They don't attract mates (A), keep them cool (B), scare predators (D), or help them run faster (E).

**20. E: making them look dangerous** - The passage describes mimicry: "The harmless milk snake has colored bands similar to the venomous coral snake, causing predators to avoid it." Mimicry makes harmless animals appear dangerous, deterring predators. It doesn't make them larger (A), help them find food (B), make them faster (C), or keep them warm (D).

**21. B: change both color and texture instantly** - The final paragraph states: "The most remarkable example might be the octopus, which can change both color and texture instantly." This dual ability to alter both color and texture rapidly makes it remarkable. Octopi can't fly (A), don't live for centuries (C), and the passage doesn't discuss their size (D) or communication (E).

**22. D: encourage persistence after failure** - The passage uses examples of famous people who overcame rejection, discusses growth mindset, and concludes with encouragement: "Your response to failure matters far more than the failure itself." The purpose is clearly to motivate readers to persist despite setbacks. It doesn't primarily criticize (A), focus on Disney's biography (B), or explain how to become famous (E).

**23. A: twelve times** - The passage states: "J.K. Rowling's first Harry Potter book was rejected by twelve publishers." This specific number is clearly stated. The book wasn't rejected never (B), once (C), or hundreds of times (D), and it wasn't rejected by every publisher (E) since it was eventually published.

**24. C: abilities can be developed** - Paragraph 3 defines growth mindset: "They believe abilities can be developed through effort and learning." This is the core concept. People with this mindset don't think failure is permanent (A), talent is fixed (B), success comes from luck (D), or mistakes should be avoided (E).

**25. E: even experts struggled at first** - This phrase suggests that people who are now masters (experts) were once disasters (beginners who struggled). It emphasizes that everyone starts poorly and improves through practice. It doesn't mean masters never fail (A), disasters can't be prevented (B), or mastery requires no practice (D).

**26. B: encouraging** - The tone throughout is positive and motivational, using inspiring examples and ending with advice to view failure constructively. The author isn't angry (A), sad (C), primarily humorous (D), or frightening (E). The encouraging tone aims to inspire readers to persist.

**27. D: quickly buried by sediment** - Paragraph 1 explains: "Most fossils form when a dead organism is quickly buried by sediment like mud or sand." Quick burial is essential for fossil formation. The passage doesn't mention being eaten by predators (A), exposure to sunlight (B), ice preservation (C), or fire (E) as common fossilization methods.

**28. A: organisms with hard parts** - Paragraph 2 states: "Organisms with hard parts like shells, bones, or teeth fossilize more easily than soft-bodied creatures. This is why we have many fossil shells but few fossil jellyfish." Hard parts fossilize better than soft tissue. Soft-bodied creatures (B) and jellyfish (C) specifically fossilize poorly.

**29. C: study Earth's history** - Paragraph 3 states: "Scientists study fossils to learn about Earth's history and the evolution of life." This is the primary scientific use of fossils. Scientists don't use fossils to predict the future (A), make jewelry (B), create new species (D), or control weather (E).

**30. E: Antarctica was once warmer** - The final paragraph states: "Fossils of tropical plants found in Antarctica prove that this frozen continent was once warm." This is a direct inference from the evidence. The fossils don't prove plants can survive freezing (A), suggest Antarctica never had plants (B), or indicate a mistake (C).

**31. C: show that fossils preserve Earth's history** - This metaphor compares the fossil record to a history book, emphasizing that fossils preserve and reveal information about Earth's past just as a book preserves information. It's not about physical heaviness (A), how scientists record data (B), or suggesting fossils are unreadable (D).

**32. D: a self-taught scholar** - The passage emphasizes that Banneker "taught himself advanced mathematics and astronomy by borrowing books and studying at night" with "almost no formal education." This defines him as self-taught. He wasn't a plantation owner (A), wasn't enslaved (B), and while he had little formal education, "self-taught scholar" is more complete than C.

**33. A: it was made from memory after seeing a watch once** - The passage states: "He had only seen a pocket watch once, yet he carved each gear and mechanism from memory." This remarkable feat of memory and engineering made the clock noteworthy. It wasn't expensive (B), wasn't the first clock ever (C), wasn't electric (D), and worked for 50 years (not poorly) (E).

**34. C: demonstrated African American intellectual ability** - Paragraph 3 states: "His almanacs were widely respected and proved that African Americans possessed the same intellectual abilities as whites—a radical idea at the time." This was their social significance. They didn't make him wealthy (A), predict the Civil War (B), or contain fiction (E).

**35. E: recreated the city plans from memory** - The passage states: "When the lead architect suddenly quit and took all the plans, Banneker recreated the entire city layout from memory." This demonstrates his remarkable memory. He didn't give up (A), hire a replacement (B), move away (C), or merely complain (D).

**36. B: point out his hypocrisy about equality** - The passage explains: "Banneker also wrote to Thomas Jefferson, challenging him to reconcile his words about equality in the Declaration of Independence with his ownership of enslaved people." Banneker was pointing out the contradiction between Jefferson's ideals and actions. He wasn't asking for a job (A), money (C), or praising Jefferson (D).

**37. D: watching an apple fall** - The passage states: "Sir Isaac Newton discovered the law of gravity in the 1600s, supposedly after watching an apple fall from a tree." This famous story is mentioned in the

passage. Newton didn't visit the Moon (A), and while he may have done experiments (C), the passage specifically mentions the apple.

**38. A: all objects with mass** - Paragraph 2 explains: "Gravity is an attractive force between all objects that have mass." The word "all" is key—gravity affects everything with mass, not just planets (B), living things (C), magnetic objects (D), or light (E).

**39. C: the Moon has less mass** - The passage states: "Earth's gravity is much stronger than the Moon's because Earth has more mass." More mass means stronger gravity, so less mass (the Moon) means weaker gravity. Distance (A), speed (B), age (D), and atmosphere (E) aren't mentioned as reasons.

**40. B: planets wouldn't orbit stars** - Paragraph 3 states: "Without gravity, planets wouldn't orbit stars, and stars wouldn't form at all. We'd float off into space instead of staying firmly planted on Earth's surface." The passage explicitly identifies planetary orbits as dependent on gravity. We wouldn't weigh more (A), and the other effects aren't mentioned.

## Verbal

**1. D: weak** - Feeble and weak both mean lacking strength or power, not strong or robust. "A feeble old man" and "a weak old man" describe someone with little physical strength. Both indicate a lack of power or vigor.

**2. B: flourish** - Thrive and flourish both mean to grow vigorously, to prosper and succeed. "Plants thrive in sunlight" means the same as "Plants flourish in sunlight." Both indicate healthy, successful growth or development.

**3. E: quick** - Prompt and quick both mean happening without delay, immediate or swift. "A prompt response" and "a quick response" both describe something that happens right away. Both emphasize speed and lack of delay.

**4. A: enormous** - Vast and enormous both mean extremely large in size, area, or extent. "A vast ocean" and "an enormous ocean" describe the same immense size. Both emphasize great magnitude or scale.

**5. C: fear** - Dread and fear both mean to anticipate with anxiety or terror, to be afraid of something. "I dread the dentist" means the same as "I fear the dentist." Both describe a feeling of anxiety or apprehension about something.

**6. D: awkward** - Clumsy and awkward both mean lacking grace or skill in movement or action, not coordinated. "A clumsy dancer" and "an awkward dancer" both describe someone who moves without grace. Both indicate lack of coordination or elegance.

**7. B: lively** - Brisk and lively both mean quick, energetic, and active. "A brisk walk" and "a lively walk" both suggest energetic movement. Both indicate vigor and animation, though brisk often emphasizes speed while lively emphasizes energy.

**8. E: desert** - Abandon and desert both mean to leave behind completely, to give up or forsake. "They abandoned the sinking ship" means the same as "They deserted the sinking ship." Both indicate leaving something or someone behind.

**9. A: freezing** - Frigid and freezing both mean extremely cold, icy. "Frigid temperatures" and "freezing temperatures" describe the same very cold conditions. Both emphasize extreme coldness.

**10. C: calm** - Tranquil and calm both mean peaceful, quiet, and free from disturbance or agitation. "A tranquil lake" and "a calm lake" describe the same peaceful, still water. Both indicate serenity and lack of disturbance.

**11. D: plenty** - Ample and plenty both mean more than enough, abundant or sufficient. "Ample food" and "plenty of food" both indicate a generous or adequate amount. Both suggest abundance or sufficiency.

**12. B: seize** - Grasp and seize both mean to take hold of firmly, to grab or clutch. "Grasp the rope" means the same as "Seize the rope." Both indicate taking firm hold of something.

**13. E: empty** - Hollow and empty both mean containing nothing inside, vacant or having a cavity. "A hollow tree" and "an empty tree" (with a cavity inside) describe similar states. Both indicate the absence of contents or substance inside.

**14. A: top** - Summit and top both mean the highest point or peak of something. "The summit of the mountain" and "the top of the mountain" refer to the same highest point. Both indicate the uppermost part.

**15. C: eager** - Keen and eager both mean showing great enthusiasm or intense desire for something. "Keen to learn" means the same as "eager to learn." Both describe enthusiastic interest or desire.

**16. D: unclear** - Vague and unclear both mean not clearly expressed or understood, indistinct or ambiguous. "A vague explanation" and "an unclear explanation" both describe something that's hard to understand. Both indicate lack of clarity or precision.

**17. B: destroy** - Ruin and destroy both mean to damage something so badly that it's unusable, to wreck or demolish. "Ruin a painting" and "destroy a painting" both describe severe damage. Both indicate causing complete damage or devastation.

**18. E: rare** - Scarce and rare both mean not common or plentiful, existing in small quantities. "Scarce resources" and "rare resources" both describe limited availability. Both indicate shortage or limited supply.

**19. A: brave** - Bold and brave both mean showing courage and willingness to face danger or difficulty. "A bold hero" and "a brave hero" describe the same courageous person. Both indicate fearlessness and courage.

**20. C: strong** - Sturdy and strong both mean solidly built, firm and capable of withstanding pressure or damage. "A sturdy table" and "a strong table" both describe durable furniture. Both emphasize strength and durability.

**21. D: shine** - Glean and shine both mean to emit light, to glow or sparkle brightly. "The stars gleam" means the same as "The stars shine." Both describe giving off light or having a bright appearance.

**22. B: weak** - Frail and weak both mean lacking physical strength, fragile or delicate. "A frail elderly person" and "a weak elderly person" describe someone with little strength. Both indicate lack of robustness or vigor.

**23. E: rise** - Soar and rise both mean to move upward through the air, to ascend or fly high. "The eagle soars" means roughly the same as "The eagle rises," though soar often implies graceful, effortless flight. Both indicate upward movement.

**24. A: clever** - Cunning and clever both mean skilled at achieving goals through ingenuity or craftiness. "A cunning plan" and "a clever plan" both describe a smart, well-thought-out strategy. Both indicate intelligence and skill, though cunning sometimes implies deception.

**25. C: damp** - Moist and damp both mean slightly wet, containing some moisture. "Moist soil" and "damp soil" describe the same slightly wet condition. Both indicate presence of water or humidity.

**26. D: old** - Ancient and old both mean having existed for a very long time, from long ago. "Ancient ruins" and "old ruins" both describe structures from the distant past. Both indicate great age, though ancient typically suggests thousands of years.

**27. B: ridicule** - Mock and ridicule both mean to make fun of someone or something in a scornful way, to tease or deride. "Mock someone's accent" and "ridicule someone's accent" both describe making fun in a mean way. Both indicate scornful teasing.

**28. E: conceited** - Vain and conceited both mean excessively proud of one's appearance or achievements, having high self-regard. "A vain person" and "a conceited person" both describe someone with excessive pride. Both indicate too much self-admiration.

**29. A: enemy** - Foe and enemy both mean someone who opposes or fights against another, an adversary or opponent. "The soldier faced his foe" means the same as "The soldier faced his enemy." Both indicate opposition or hostility.

**30. C: harsh** - Grim and harsh both mean severe, forbidding, or unpleasant in character or appearance. "Grim circumstances" and "harsh circumstances" both describe difficult, severe conditions. Both indicate sternness or severity.

**31. D: thirsty is to throat - Relationship: Physical sensation to body part where it's felt.** Hunger is felt in the stomach, just as thirst is felt in the throat. Both pairs show a physical need or sensation and the body part where it's most noticeably felt.

**32. B: wing is to airplane - Relationship: Part that enables movement to vehicle.** A sail enables a boat to move using wind, just as a wing enables an airplane to fly. Both show the key component that allows the vehicle to travel through its medium (water/air).

**33. E: skin is to human - Relationship: Outer covering/protection to organism.** Bark is the outer protective layer of a tree, just as skin is the outer protective layer of a human. Both show the external covering that protects the organism.

**34. A: mechanic is to garage - Relationship: Professional to workplace.** A chef works in a kitchen, just as a mechanic works in a garage. Both show a professional and the specific place where they perform their work.

**35. C: sunrise is to sunset - Relationship: Beginning of day cycle to end of day cycle.** Dawn (early morning) is the beginning of daylight while dusk (early evening) is the end of daylight, just as sunrise marks day's beginning and sunset marks day's end. Both pairs show opposite ends of the daily light cycle.

**36. D: tiptoe is to march - Relationship: Quiet/gentle action to loud/forceful version.** Whispering is speaking quietly while yelling is speaking loudly; tiptoeing is walking quietly while marching is walking loudly/forcefully. Both pairs contrast quiet, gentle actions with loud, forceful ones.

**37. B: sculptor is to stone - Relationship: Artist to primary material they work with.** A carpenter works primarily with wood, just as a sculptor works primarily with stone. Both show an artisan and the main material they shape or transform in their work.

**38. E: simmer is to boil - Relationship: Moderate degree to extreme degree of same process.** Chill is moderately cold while freeze is extremely cold; simmer is moderate heat while boil is extreme heat. Both show increasing intensity of the same temperature-related process.

**39. A: flag is to country - Relationship: Symbol to what it represents.** Scales symbolize justice (fairness, weighing evidence), just as a flag symbolizes a country. Both show objects that represent abstract concepts or entities.

**40. C: screen is to computer - Relationship: Display/viewing component to device.** A lens is the viewing component of glasses, just as a screen is the viewing/display component of a computer. Both show the part that allows you to see the information or view clearly.

**41. D: hoof is to horse - Relationship: Foot/locomotion structure to animal.** A paw is a cat's foot, just as a hoof is a horse's foot. Both show the structure an animal uses for walking or running.

**42. B: practice is to game - Relationship: Preparation activity to main event.** Rehearsing prepares you for a play, just as practicing prepares you for a game. Both show preparatory activities done before the actual performance or competition.

**43. E: spark is to fire - Relationship: Small beginning to large result.** An acorn (small) grows into a mighty (large) oak tree, just as a spark (small) can grow into a fire (large). Both show something small that develops into something much larger.

**44. A: satisfy is to hunger - Relationship: Action that addresses/eliminates need.** Quenching addresses thirst, just as satisfying addresses hunger. Both show actions that fulfill or eliminate a physical need.

**45. C: opaque is to wood - Relationship: Characteristic property to material possessing it.** Glass is transparent (you can see through it), just as wood is opaque (you can't see through it). Both show materials paired with their optical properties.

**46. D: archipelago is to islands - Relationship: Collective term for group to individual units.** A constellation is a group of stars, just as an archipelago is a group of islands. Both show specialized terms for collections of similar objects.

**47. B: keyboard is to writer - Relationship: Tool to professional who uses it.** A palette is a painter's tool for holding colors, just as a keyboard is a writer's tool for typing. Both show implements that professionals use to create their work.

**48. E: famine is to food - Relationship: Shortage condition to what is lacking.** A drought is a severe shortage of water, just as a famine is a severe shortage of food. Both show crisis conditions defined by the absence of something essential.

**49. A: step is to staircase - Relationship: Individual unit to structure composed of those units.** A rung is one of the horizontal bars making up a ladder, just as a step is one of the horizontal surfaces making up a staircase. Both show single components of a climbing structure.

**50. C: director is to actors - Relationship: Leader to group being directed.** A conductor leads and directs an orchestra, just as a director leads and directs actors. Both show someone in charge of coordinating a group's performance.

**51. D: prism is to separate - Relationship: Optical device to its function.** A lens functions to focus light, just as a prism functions to separate light into colors. Both show optical tools and their specific purposes.

**52. B: tired is to sleep - Relationship: State/need to natural response.** Being curious prompts you to investigate, just as being tired prompts you to sleep. Both show a state or feeling that naturally leads to a corresponding action.

**53. E: recipe is to cook - Relationship: Guide/instructions to action performed.** A map helps you navigate, just as a recipe helps you cook. Both show instructional tools that guide you through a process.

**54. A: smooth is to glass - Relationship: Textural property to material exhibiting it.** Sandpaper has a rough texture, just as glass has a smooth texture. Both pair materials with their characteristic surface qualities.

**55. C: migrate is to season - Relationship: Animal behavior to time period triggering it.** Animals hibernate during winter, just as animals migrate during certain seasons. Both show animal behaviors tied to specific times of year.

**56. D: wise is to owl - Relationship: Characteristic to animal symbolizing it.** Stubborn is a trait associated with mules (in popular saying), just as wise is a trait associated with owls (in folklore and symbolism). Both show animals used to represent particular qualities.

**57. B: begin is to end - Relationship: Opposite actions.** Ignite and extinguish are opposite actions (starting versus stopping fire), just as begin and end are opposite actions. Both pairs show actions that reverse or oppose each other.

**58. E: feather is to bird - Relationship: Outer covering to creature it covers.** A petal is the outer covering of a flower (what you see first), just as a feather is the outer covering of a bird. Both show the external layer that covers and characterizes the organism.

**59. A: microscope is to biologist - Relationship: Specialized instrument to scientist who uses it.** An astronomer uses a telescope to observe distant objects, just as a biologist uses a microscope to observe tiny objects. Both show scientists paired with their primary observational tools.

**60. C: salty is to ocean - Relationship: Taste characteristic to source.** Lemons are bitter (or sour), just as the ocean is salty. Both pair a taste quality with a common source of that taste. (Note: Lemons are technically more sour than bitter, but the relationship pattern holds as taste-to-source.)

## Quantitative

**1. B: \$27** - First, find the cost per book:  $\$72 \div 8 \text{ books} = \$9 \text{ per book}$ . Then multiply by 3:  $\$9 \times 3 = \$27$ . You can also set up a proportion:  $8 \text{ books}/\$72 = 3 \text{ books}/x$ , cross multiply:  $8x = 216$ , so  $x = 27$ .

**2. D: 5** - Examine the pattern: 80 to 40 is  $\div 2$ , 40 to 20 is  $\div 2$ , 20 to 10 is  $\div 2$ . Each number is divided by 2 to get the next number. This is a geometric sequence with a common ratio of  $1/2$ . To find the next number:  $10 \div 2 = 5$ .

**3. A: 27** - Solve the equation  $x + 15 = 42$  by subtracting 15 from both sides:  $x = 42 - 15 = 27$ . Check:  $27 + 15 = 42 \checkmark$  This is a one-step equation requiring only subtraction.

**4. C: 144** - A square has four equal sides. If perimeter = 48, then each side =  $48 \div 4 = 12$ . Area of a square = side  $\times$  side =  $12 \times 12 = 144$  square units. Don't confuse perimeter with area—perimeter is distance around, area is space inside.

**5. E: 1/2** - When adding fractions with the same denominator, keep the denominator and add numerators:  $3/8 + 1/8 = (3 + 1)/8 = 4/8$ . Simplify by dividing both numerator and denominator by 4:  $4/8 = 1/2$ .

**6. B: 13** - Solve  $7m = 91$  by dividing both sides by 7:  $m = 91 \div 7 = 13$ . Check:  $7 \times 13 = 91 \checkmark$  You can think of this as "7 times what number equals 91?"

**7. D: 6/15** - Total marbles: 6 red + 9 blue = 15 marbles. Probability of selecting red = red marbles/total marbles =  $6/15$ . This can be simplified to  $2/5$  by dividing both by 3, but  $6/15$  is the answer shown in the choices.

**8. A: 90** - To find 60% of 150, multiply:  $0.60 \times 150 = 90$ . Mental math: 10% of 150 is 15, so 60% is 6 times that:  $6 \times 15 = 90$ . Alternatively,  $60\% = 3/5$ , so  $(3/5) \times 150 = 90$ .

- 9. C: 6,000** - When rounding to the nearest thousand, look at the hundreds digit. In 5,678, the hundreds digit is 6. Since  $6 \geq 5$ , round up: increase the thousands digit from 5 to 6, making 6,000.
- 10. E: 243** - Examine the pattern: 3 to 9 is  $\times 3$ , 9 to 27 is  $\times 3$ , 27 to 81 is  $\times 3$ . Each number is multiplied by 3 to get the next. This is a geometric sequence with ratio 3. To find the next:  $81 \times 3 = 243$ .
- 11. B: 46** - Perimeter of a rectangle =  $2(\text{length} + \text{width}) = 2(15 + 8) = 2(23) = 46$ . Or add all four sides:  $15 + 15 + 8 + 8 = 46$ . Don't confuse with area, which would be  $15 \times 8 = 120$ .
- 12. D: 4** - The GCF is the largest number that divides evenly into both numbers. Factors of 20: 1, 2, 4, 5, 10, 20. Factors of 32: 1, 2, 4, 8, 16, 32. Common factors: 1, 2, 4. The greatest is 4. Check:  $20 \div 4 = 5$  and  $32 \div 4 = 8$ .
- 13. A: 8** - Solve  $4x + 6 = 38$  in two steps. Subtract 6 from both sides:  $4x = 32$ . Divide both sides by 4:  $x = 8$ . Check:  $4(8) + 6 = 32 + 6 = 38 \checkmark$
- 14. C: \$3.00** - Multiply the price per pencil by the number of pencils:  $\$0.25 \times 12 = \$3.00$ . Mental math:  $\$0.25$  is one quarter, so 12 quarters =  $\$3.00$  (since 4 quarters =  $\$1$ , and  $12 \div 4 = 3$ ).
- 15. E: 50** - Follow order of operations: calculate the exponent first.  $5^2 = 5 \times 5 = 25$ . Then multiply by 2:  $25 \times 2 = 50$ . Don't multiply  $5 \times 2$  first—exponents come before multiplication.
- 16. B: 17** - The compound inequality  $a < 20$  and  $a > 15$  means  $a$  must be greater than 15 AND less than 20. Check: 17 satisfies both ( $17 > 15 \checkmark$  and  $17 < 20 \checkmark$ ). Choice A (15) doesn't work because  $a$  must be greater than 15, not equal. Choice C (20) doesn't work because  $a$  must be less than 20.
- 17. D: 25** - The ratio 4:5 means for every 4 dogs, there are 5 cats. If there are 20 dogs, find how many groups of 4:  $20 \div 4 = 5$  groups. Each group has 5 cats, so total cats =  $5 \times 5 = 25$ . Or set up a proportion:  $4/5 = 20/x$ , cross multiply:  $4x = 100$ , so  $x = 25$ .
- 18. A: 14** - To find  $2/5$  of 35, multiply:  $(2/5) \times 35$ . Divide 35 by 5 first:  $35 \div 5 = 7$ . Then multiply by 2:  $7 \times 2 = 14$ . Think of it as: 35 divided into 5 parts gives 7 per part, and 2 parts = 14.
- 19. C:  $75^\circ$**  - The sum of all angles in any triangle equals  $180^\circ$ . We know two angles:  $45^\circ$  and  $60^\circ$ . To find the third:  $180^\circ - 45^\circ - 60^\circ = 180^\circ - 105^\circ = 75^\circ$ . Check:  $45^\circ + 60^\circ + 75^\circ = 180^\circ \checkmark$
- 20. E: 80** - Look at the pattern: 100 to 95 is  $-5$ , 95 to 90 is  $-5$ , 90 to 85 is  $-5$ . Each number decreases by 5. This is an arithmetic sequence with common difference of  $-5$ . Next number:  $85 - 5 = 80$ .
- 21. B: 15** - The LCM is the smallest number that both numbers divide into evenly. Since 15 is a multiple of 5 ( $15 = 5 \times 3$ ), the LCM of 5 and 15 is simply 15. Verify:  $15 \div 5 = 3 \checkmark$  and  $15 \div 15 = 1 \checkmark$ . When one number is a multiple of the other, the larger number is the LCM.
- 22. D:  $7/12$**  - If 5 slices out of 12 are eaten, then  $12 - 5 = 7$  slices remain. The fraction remaining =  $7/12$ . Don't confuse what's eaten ( $5/12$ ) with what remains ( $7/12$ ). Always check what the question asks for.

**23. A: 24** - First solve for  $y$ :  $6 + y = 18$ , so  $y = 12$ . Then find  $2y$ :  $2 \times 12 = 24$ . This is a two-step problem—solve for the variable first, then use that value to find what's asked.

**24. C: 28** - To find 35% of 80, multiply:  $0.35 \times 80 = 28$ . Mental math: 10% of 80 is 8, so 30% is 24 ( $3 \times 8$ ), and 5% is 4, giving  $24 + 4 = 28$ .

**25. E: 7** - Work backwards or set up an equation. Let  $x$  be the number. The problem states:  $(x \times 4) + 7 = 35$ . Solve:  $4x + 7 = 35$ . Subtract 7:  $4x = 28$ . Divide by 4:  $x = 7$ . Check:  $7 \times 4 = 28$ , then  $28 + 7 = 35$  ✓