MIDDLE LEVEL SSAT PRACTICE TEST 2

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. Fill in the circle next to your topic choice.

Topic A: I had visited my grandmother's attic a hundred times before, but this time I noticed something I'd never seen—a door hidden behind the old wardrobe.

Topic B: Everyone faces moments when they feel like giving up. Describe a time when you persisted through something difficult. What motivated you to keep going, and what did you learn about yourself?

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 144 ÷ 12?

A. 11

B. 10

C. 12

D. 14

E. 13

2. If n − 18 = 35, then n =

A. 17

B. 43

C. 27

D. 47

E. 53

3. A sequence follows the rule: add 7 to the previous number. If the first number is 5, what is the 4th number?

A. 19

B. 26

C. 33

D. 12

E. 21

4. What is the area of a rectangle with length 9 and width 7?

A. 63

B. 32

C. 16

D. 56

E. 72

5. If $3x = 48$, then $x =$

A. 45

B. 51

C. 144

D. 16

E. 12

6. A class has 30 students. If 2/5 of them are girls, how many are boys?

A. 12

B. 15

C. 18

D. 20

E. 10

7. What is $25 + 5 \times 4$?

A. 120

B. 100

C. 30

D. 50

E. 45

8. A die is rolled once. What is the probability of rolling a number greater than 4?

A. 1/6

B. 1/3

C. 1/2

D. 2/3

E. 1/4

9. Which of the following is equivalent to 0.75?

A. 3/4

B. 7/5

C. 75/10

D. 1/4

E. 7/10

10. A circle has a radius of 6. What is its diameter?

A. 3

B. 18

C. 36

D. 12

E. 24
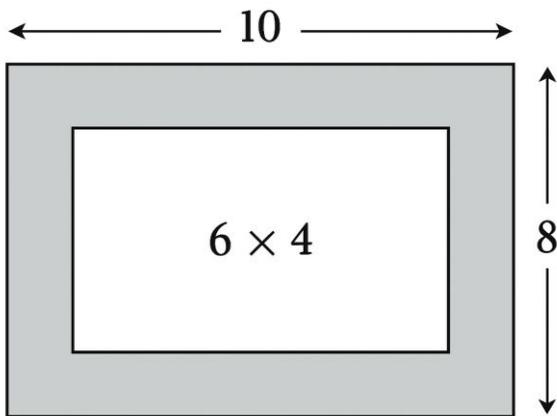
11. If $4y + 8 = 32$, then $y =$

A. 8

B. 5

C. 6

D. 10

E. 4

12. A store originally priced a shirt at $40. It's now on sale for 25% off. What is the sale price?

A. $35

B. $25

C. $15

D. $20

E. $30

13. What is $9^2 - 7^2$?

A. 2

B. 32

C. 16

D. 4

E. 50

14. In the rectangle shown, what is the area of the shaded region?

A. 56

B. 24

C. 80

D. 32

E. 48

15. If b > 25 and b < 30, which could NOT be the value of b?

A. 26

B. 27.5

C. 29

D. 30

E. 28

16. A recipe requires 2 cups of flour to make 12 cookies. How many cups of flour are needed to make 18 cookies?

A. 2

B. 2.5

C. 3

D. 4

E. 6

17. What is 5/8 − 1/8?

A. 4/16

B. 6/8

C. 5/16

D. 3/4

E. 1/2

18. Round 3,456 to the nearest ten.

A. 3,450

B. 3,460

C. 3,400

D. 3,500

E. 3,000

19. What is the least common multiple (LCM) of 4 and 10?

A. 20

B. 40

C. 2

D. 10

E. 14

20. If the pattern continues: 2, 4, 8, 16, ___, what is the next number?

A. 24

B. 20

C. 18

D. 32

E. 64

21. A triangle has a base of 10 and a height of 12. What is its area?

A. 22

B. 120

C. 60

D. 30

E. 50

22. What is 15% of 200?

A. 15

B. 20

C. 25

D. 35

E. 30

23. If $12 \times p = 144$, then $p =$

A. 11

B. 12

C. 10

D. 132

E. 156

24. A number is divided by 5, then 3 is subtracted. The result is 7. What is the number?

A. 50

B. 20

C. 35

D. 25

E. 40

25. The ratio of apples to oranges in a basket is 3:2. If there are 9 apples, how many oranges are there?

A. 3

B. 12

C. 18

D. 6

E. 15

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

Coral reefs are often called "rainforests of the sea" because they support incredible marine life diversity. Despite covering less than 1% of the ocean floor, reefs provide habitat for approximately 25% of all marine species.

Coral may look like colorful rocks, but they're actually tiny animals called polyps that live in colonies. Each polyp has a hard outer skeleton made of calcium carbonate. Over hundreds of years, these skeletons build up to create massive reef structures.

Coral polyps have a special relationship with algae called zooxanthellae that live inside their tissues. The algae provide food through photosynthesis, while the coral provides shelter. This partnership is why coral needs sunlight and lives in shallow, clear water.

Unfortunately, coral reefs face serious threats. Rising ocean temperatures cause coral bleaching—when stressed coral expels its algae, turning white and often dying. Pollution, overfishing, and physical damage from boats also harm reefs. Scientists estimate that without protection, most reefs could disappear within 50 years.

1. According to the passage, coral reefs support what percentage of marine species?

A. 1%

B. 10%

C. 25%

D. 50%

E. 75%

2. Coral polyps are best described as

A. tiny animals

B. plants

C. rocks

D. fish

E. algae

3. The relationship between coral and zooxanthellae is

A. competitive

B. harmful

C. unimportant

D. temporary

E. mutually beneficial

4. Coral bleaching occurs when

A. coral grows too large

B. coral expels its algae

C. coral eats too much

D. water becomes too cold

E. fish attack coral

5. The passage suggests that without protection, most reefs could disappear within

A. 10 years

B. 25 years

C. 100 years

D. 50 years

E. 5 years

Passage 2

The school bell rang, but Emma didn't move. She stared at the returned math test on her desk: 67%. Not just a failing grade—her lowest score ever.

"Emma?" Mrs. Chen's voice was gentle. "Can you stay for a minute?"

Emma nodded, waiting as her classmates filed out. Some glanced at her sympathetically; others didn't notice at all.

"I know this isn't like you," Mrs. Chen said, sitting beside her. "What's going on?"

Emma's throat tightened. How could she explain? That her parents were getting divorced? That she'd been staying up late hearing them argue? That she couldn't concentrate on anything, let alone equations?

"I'm just... distracted," she finally managed.

Mrs. Chen nodded slowly. "Life can be overwhelming sometimes. But you don't have to handle everything alone. Would it help to talk to the school counselor? And I can give you extra time to retake this test."

For the first time in weeks, Emma felt a small weight lift. Maybe asking for help wasn't giving up. Maybe it was the bravest thing she could do.

6. Emma's main problem in the passage is

A. difficulty concentrating due to family stress

B. not understanding math

C. disliking her teacher

D. feeling tired from sports

E. having too much homework

7. Mrs. Chen's reaction to Emma's poor grade is

A. angry

B. disappointed

C. understanding

D. indifferent

E. surprised

8. Emma initially doesn't explain her situation because

A. she doesn't trust Mrs. Chen

B. she's embarrassed

C. she doesn't know why

D. she wants to fail

E. she finds it difficult to talk about

9. Mrs. Chen offers to help Emma by

A. lowering the test difficulty

B. suggesting counseling and a retake

C. calling her parents

D. giving her the answers

E. canceling the test

10. The passage suggests that Emma realizes

A. she should quit school

B. math is too hard

C. she should transfer classes

D. asking for help shows strength

E. her problems can't be solved

Passage 3

The Pony Express was a mail delivery service that operated for only 18 months, from April 1860 to October 1861. Despite its brief existence, it became legendary in American history.

The service used relay teams of horse riders to carry mail from Missouri to California—a distance of nearly 2,000 miles. Riders changed horses every 10 to 15 miles at relay stations. Each rider covered about 75 miles before passing the mail to the next rider. The entire journey took just 10 days, compared to several weeks by stagecoach.

The job was dangerous and exhausting. Riders faced severe weather, rough terrain, and sometimes hostile encounters. An advertisement seeking riders famously stated: "Wanted: Young, skinny, wiry fellows. Must be expert riders willing to risk death daily. Orphans preferred."

The Pony Express ended when the transcontinental telegraph was completed, making instant communication possible. Though short-lived, the Pony Express proved that rapid coast-to-coast communication was achievable and helped unite a divided nation during troubled times.

11. The Pony Express operated for approximately

A. 5 months

B. 1 year

C. 3 years

D. 10 years

E. 18 months

12. Mail was delivered from Missouri to California in about

A. 1 day

B. 5 days

C. 10 days

D. 3 weeks

E. 2 months

13. Riders changed horses every

A. 75 miles

B. 10 to 15 miles

C. 100 miles

D. 5 miles

E. 50 miles

14. The Pony Express ended because

A. too many riders quit

B. horses became scarce

C. the routes were too dangerous

D. the telegraph was completed

E. it ran out of money

15. The job advertisement preferred orphans because

A. the work was extremely dangerous

B. orphans rode horses better

C. orphans were cheaper to hire

D. they had more time

E. they were stronger

Passage 4

Photosynthesis is the process plants use to convert sunlight into energy. This remarkable process not only feeds the plant but also produces oxygen that animals—including humans—need to breathe.

The process occurs mainly in leaves, which contain chlorophyll, a green pigment that captures sunlight. During photosynthesis, plants take in carbon dioxide from the air and water from the soil. Using energy from sunlight, they convert these into glucose (a sugar) and oxygen. The glucose provides energy for the plant to grow, while oxygen is released into the air.

The equation for photosynthesis is: carbon dioxide + water + sunlight → glucose + oxygen. This process is essentially the opposite of respiration, which animals use to convert glucose and oxygen back into energy, carbon dioxide, and water.

Without photosynthesis, life on Earth as we know it couldn't exist. Plants form the foundation of most food chains, and the oxygen they produce is essential for animal life. Additionally, photosynthesis helps remove carbon dioxide from the atmosphere, playing a role in regulating Earth's climate.

16. The main purpose of this passage is to

A. describe different types of plants

B. explain chlorophyll's color

C. explain how photosynthesis works

D. compare plants and animals

E. discuss climate change

17. Chlorophyll's primary function is to

A. make leaves green

B. store water

C. protect plants

D. produce roots

E. capture sunlight

18. During photosynthesis, plants take in

A. glucose and oxygen

B. oxygen and nitrogen

C. sunlight and glucose

D. carbon dioxide and water

E. chlorophyll and minerals

19. The passage states that photosynthesis is the opposite of

A. respiration

B. digestion

C. circulation

D. reproduction

E. germination

20. Without photosynthesis, the passage suggests

A. plants would grow faster

B. life on Earth couldn't exist as it does

C. animals would be healthier

D. Earth would be warmer

E. oceans would disappear

Passage 5

Amelia Earhart was born in 1897 and grew up fascinated by adventure. In 1920, she took her first airplane ride and knew immediately that she had to fly. Within six months, she had saved enough money for flying lessons and bought her own plane.

In 1928, Earhart became the first woman to fly across the Atlantic Ocean as a passenger. Though she didn't pilot the plane herself, the achievement made her famous. Unsatisfied with being just a passenger, she became the first woman to fly solo across the Atlantic in 1932, proving she was a skilled pilot in her own right.

Earhart used her fame to advocate for women's rights and opportunities. She believed women could do anything men could do if given the chance. She encouraged young women to pursue careers in aviation and other fields traditionally dominated by men.

In 1937, Earhart attempted to fly around the world at the equator—a journey of 29,000 miles. She and her navigator, Fred Noonan, disappeared over the Pacific Ocean and were never found. Despite the tragic end, Earhart's courage and achievements continue to inspire people today.

21. Amelia Earhart first flew across the Atlantic in 1928 as

A. the pilot

B. co-pilot

C. navigator

D. a passenger

E. the engineer

22. Earhart proved her piloting skill by

A. buying a plane

B. taking flying lessons

C. teaching others to fly

D. becoming a mechanic

E. flying solo across the Atlantic

23. Besides flying, Earhart was known for

A. writing novels

B. teaching math

C. advocating for women's rights

D. painting portraits

E. playing music

24. Earhart disappeared while attempting to

A. fly around the world

B. cross the Atlantic again

C. set a speed record

D. reach the North Pole

E. test a new aircraft

25. The passage suggests Earhart's legacy is one of

A. tragedy

B. courage and inspiration

C. controversy

D. scientific discovery

E. wealth

Passage 6

Migration is one of nature's most impressive feats. Every year, billions of animals travel vast distances to find food, suitable climates, or breeding grounds. These journeys can span thousands of miles and face numerous dangers.

Arctic terns hold the record for the longest migration, traveling about 44,000 miles annually from Arctic to Antarctic and back. Monarch butterflies, despite their delicate appearance, migrate up to 3,000 miles from Canada to Mexico. Gray whales swim 12,000 miles round-trip along the Pacific coast.

Animals navigate using various methods. Some use the sun or stars for direction. Others follow Earth's magnetic field. Many birds use landmarks like rivers and mountains. Some species even appear to have mental maps inherited from their ancestors.

Migration isn't without risks. Animals face exhaustion, starvation, predators, and increasingly, human-made obstacles like buildings, power lines, and habitat destruction. Climate change is also disrupting traditional migration patterns as temperatures and seasons shift.

Despite these challenges, migration continues because the benefits outweigh the risks. Access to abundant food, better weather, and safe breeding grounds makes the dangerous journey worthwhile.

26. According to the passage, Arctic terns migrate approximately

A. 3,000 miles

B. 12,000 miles

C. 20,000 miles

D. 30,000 miles

E. 44,000 miles

27. Monarch butterflies migrate primarily between

A. Canada and Mexico

B. Alaska and Hawaii

C. Europe and Africa

D. Asia and Australia

E. North and South Pole

28. Animals navigate during migration using all of the following EXCEPT

A. compasses

B. the sun

C. stars

D. Earth's magnetic field

E. landmarks

29. The passage suggests migration is disrupted by

A. cold weather

B. food abundance

C. climate change

D. natural predators only

E. short distances

30. Animals continue to migrate despite risks because

A. they enjoy traveling

B. the benefits are worth the dangers

C. they have no choice

D. it's easy

E. humans force them

Passage 7

"I can't believe you forgot!" Maya's voice cracked as she held up the science project—or rather, what was left of it. The model volcano lay in pieces, destroyed when her little brother had knocked it off the table while playing.

"I'm sorry!" Jamal's eyes filled with tears. "I didn't mean to! Mom asked me to get something from the kitchen and I bumped the table and—"

Maya wanted to stay angry. The project was due tomorrow. She'd spent two weeks building it, carefully painting the papier-mâché, wiring the lights. But looking at Jamal's devastated face, she remembered when she'd accidentally deleted his favorite video game save file. He'd forgiven her.

"It's okay," she said finally, though her voice wobbled. "It was an accident. But you're helping me fix it."

They worked until midnight, Mom supervising with coffee and encouragement. The rebuilt volcano wasn't as perfect as the original. The paint job was rushed, and one side leaned slightly. But when Maya presented it the next day and explained what happened, her teacher praised not the volcano but what she'd learned: that sometimes the most important projects aren't the ones we turn in, but the relationships we build while creating them.

31. The main conflict in the story is

A. Maya vs. her teacher

B. Maya vs. Jamal

C. Maya vs. time

D. Maya vs. her mother

E. Maya vs. herself and her anger

32. Maya decides to forgive Jamal because

A. her mother forces her

B. the project wasn't important

C. she remembers he forgave her once

D. he offers to pay for it

E. she wasn't really angry

33. The story suggests that Maya's real lesson was about

A. building volcanoes

B. managing time

C. following directions

D. valuing relationships

E. pursuing perfection

34. The rebuilt volcano was

A. imperfect but completed with help

B. better than the original

C. identical to the first one

D. rejected by the teacher

E. never finished

35. The teacher's reaction emphasizes the importance of

A. perfect projects

B. learning from challenges

C. finishing early

D. working alone

E. avoiding mistakes

Passage 8

The human brain is the most complex organ in the body, containing approximately 86 billion neurons. These nerve cells communicate through electrical and chemical signals, forming networks that control everything we do—from breathing to thinking.

The brain has different regions responsible for specific functions. The cerebrum, the largest part, handles thinking, memory, and voluntary movement. The cerebellum coordinates balance and movement. The brain stem controls automatic functions like heartbeat and breathing.

Interestingly, the brain uses about 20% of the body's energy despite being only 2% of body weight. It never truly rests—even during sleep, it remains active, processing memories and clearing waste products.

The brain is also remarkably adaptable through a process called neuroplasticity. When one area is damaged, other parts can sometimes take over its functions. Learning new skills creates new neural connections, which is why practicing and studying physically change your brain.

Scientists still don't fully understand how the brain creates consciousness, emotion, and personality. Neuroscience continues to reveal fascinating insights about this three-pound organ that makes us who we are.

36. The human brain contains approximately

A. 10 billion neurons

B. 86 billion neurons

C. 100 billion neurons

D. 1 trillion neurons

E. 50 billion neurons

37. The cerebrum is responsible for

A. only breathing

B. only heartbeat

C. only balance

D. thinking and voluntary movement

E. automatic functions only

38. Despite being 2% of body weight, the brain uses

A. 5% of energy

B. 20% of energy

C. 50% of energy

D. 2% of energy

E. 10% of energy

39. Neuroplasticity refers to the brain's ability to

A. adapt and form new connections

B. increase in size

C. decrease energy use

D. stop working

E. control emotions only

40. According to the passage, scientists still don't fully understand how the brain creates

A. heartbeat

B. movement

C. consciousness

D. reflexes

E. breathing

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)

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. TIMID:

A. brave

B. shy

C. loud

D. angry

E. strong

2. SOLEMN:

A. happy

B. cheerful

C. playful

D. joyful

E. serious

3. NOTIFY:

A. inform

B. hide

C. forget

D. ignore

E. confuse

4. SPACIOUS:

A. tiny

B. narrow

C. cramped

D. roomy

E. closed

5. CAUTION:

A. recklessness

B. danger

C. care

D. speed

E. noise

6. FRIGID:

A. warm

B. hot

C. mild

D. comfortable

E. icy

7. BRIEF:

A. long

B. short

C. tall

D. wide

E. deep

8. DISTRESS:

A. suffering

B. joy

C. peace

D. comfort

E. happiness

9. NIMBLE:

A. clumsy

B. slow

C. heavy

D. agile

E. tired

10. OBVIOUS:

A. hidden

B. secret

C. clear

D. mysterious

E. vague

11. FRANTIC:

A. calm

B. panicked

C. peaceful

D. relaxed

E. quiet

12. NOBLE:

A. poor

B. common

C. ordinary

D. lowly

E. honorable

13. DWINDLE:

A. decrease

B. grow

C. expand

D. increase

E. multiply

14. TOLERATE:

A. refuse

B. reject

C. endure

D. deny

E. prohibit

15. LAVISH:

A. simple

B. plain

C. modest

D. extravagant

E. cheap

16. DISPUTE:

A. agree

B. argue

C. accept

D. approve

E. support

17. GRACIOUS:

A. rude

B. mean

C. harsh

D. cruel

E. courteous

18. DISTORT:

A. twist

B. straighten

C. fix

D. correct

E. align

19. VIGOR:

A. weakness

B. fatigue

C. tiredness

D. energy

E. sickness

20. ABRUPT:

A. gradual

B. slow

C. sudden

D. smooth

E. gentle

21. SECLUDE:

A. include

B. invite

C. welcome

D. gather

E. isolate

22. DORMANT:

A. active

B. inactive

C. energetic

D. lively

E. awake

23. VALIANT:

A. cowardly

B. timid

C. fearful

D. courageous

E. weak

24. MENACE:

A. threat

B. safety

C. protection

D. help

E. comfort

25. BRITTLE:

A. flexible

B. soft

C. fragile

D. strong

E. sturdy

26. SCORN:

A. admire

B. respect

C. praise

D. honor

E. disdain

27. TRANQUIL:

A. noisy

B. peaceful

C. chaotic

D. busy

E. loud

28. PONDER:

A. ignore

B. forget

C. dismiss

D. consider

E. avoid

29. VALOR:

A. bravery

B. fear

C. cowardice

D. weakness

E. timidity

30. RADIANT:

A. dull

B. dark

C. bright

D. dim

E. shadowy

ANALOGIES (Questions 31-60)

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. Pencil is to write as

A. book is to read

B. chair is to sit

C. knife is to cut

D. plate is to eat

E. cup is to drink

32. Tadpole is to frog as

A. bird is to egg

B. fish is to water

C. dog is to puppy

D. cat is to kitten

E. caterpillar is to butterfly

33. Thermometer is to temperature as

A. telescope is to stars

B. scale is to weight

C. camera is to picture

D. microscope is to small

E. compass is to direction

34. Blossom is to tree as

A. root is to plant

B. wave is to ocean

C. cloud is to sky

D. petal is to flower

E. branch is to leaf

35. Proud is to achievement as

A. grateful is to gift

B. angry is to calm

C. happy is to sad

D. tired is to sleep

E. hungry is to full

36. Architect is to building as

A. teacher is to school

B. doctor is to hospital

C. composer is to symphony

D. actor is to theater

E. pilot is to airport

37. Whisper is to shout as

A. walk is to run

B. talk is to speak

C. crawl is to sprint

D. sit is to stand

E. tiptoe is to stomp

38. Chapter is to book as

A. word is to sentence

B. scene is to play

C. verse is to song

D. page is to novel

E. paragraph is to essay

39. Transparent is to window as

A. hard is to rock

B. soft is to pillow

C. rough is to sandpaper

D. opaque is to wall

E. smooth is to silk

40. Comedian is to laughter as

A. musician is to applause

B. athlete is to victory

C. artist is to painting

D. writer is to book

E. teacher is to student

41. Stream is to river as

A. puddle is to ocean

B. drop is to rain

C. brook is to lake

D. pond is to sea

E. creek is to bay

42. Yolk is to egg as

A. skin is to fruit

B. shell is to nut

C. pit is to cherry

D. peel is to banana

E. seed is to apple

43. Frown is to sadness as

A. smile is to happiness

B. grin is to joy

C. scowl is to anger

D. laugh is to humor

E. cry is to tears

44. Shepherd is to sheep as

A. farmer is to crops

B. teacher is to students

C. guard is to prisoners

D. cowboy is to cattle

E. trainer is to athletes

45. Ignite is to fire as

A. plant is to seed

B. freeze is to ice

C. heat is to oven

D. cool is to refrigerator

E. burn is to ash

46. Sculptor is to chisel as

A. painter is to canvas

B. writer is to paper

C. carpenter is to hammer

D. musician is to stage

E. chef is to kitchen

47. Drizzle is to downpour as

A. breeze is to gust

B. wind is to storm

C. rain is to snow

D. cloud is to sky

E. whisper is to yell

48. Acorn is to oak as

A. flower is to garden

B. seed is to plant

C. root is to tree

D. leaf is to branch

E. fruit is to vine

49. Optometrist is to eyes as

A. cardiologist is to heart

B. pediatrician is to children

C. surgeon is to operations

D. dentist is to teeth

E. nurse is to patients

50. Quench is to thirst as

A. satisfy is to hunger

B. cure is to illness

C. heal is to wound

D. solve is to problem

E. answer is to question

51. Dawn is to morning as

A. noon is to afternoon

B. evening is to night

C. twilight is to dusk

D. midnight is to day

E. sunrise is to sunset

52. Mansion is to house as

A. cottage is to home

B. palace is to castle

C. apartment is to building

D. tent is to shelter

E. yacht is to boat

53. Lens is to eye as

A. ear is to sound

B. eardrum is to ear

C. nose is to smell

D. tongue is to taste

E. skin is to touch

54. Blizzard is to snow as

A. rain is to storm

B. wind is to tornado

C. cloud is to fog

D. hurricane is to wind

E. thunder is to lightning

55. Recruit is to soldier as

A. apprentice is to expert

B. student is to teacher

C. novice is to master

D. amateur is to professional

E. beginner is to veteran

56. Flock is to birds as

A. herd is to cattle

B. pack is to wolves

C. school is to fish

D. colony is to ants

E. swarm is to bees

57. Orbit is to planet as

A. spin is to top

B. rotate is to wheel

C. turn is to corner

D. circle is to ring

E. revolve is to moon

58. Oasis is to desert as

A. forest is to trees

B. island is to ocean

C. mountain is to valley

D. river is to stream

E. lake is to land

59. Anchor is to ship as

A. foundation is to building

B. wheels is to car

C. wings is to airplane

D. roots is to tree

E. sails is to boat

60. Hostile is to enemy as

A. friendly is to ally

B. angry is to foe

C. kind is to stranger

D. polite is to guest

E. rude is to opponent

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 $72 \div x = 9$, then $x =$

A. 63

B. 81

C. 7

D. 8

E. 9

2. What is $15 - 3 \times 4 + 2$?

A. 5

B. 50

C. 14

D. 46

E. 10

3. A square has a side length of 11. What is its perimeter?

A. 22

B. 121

C. 44

D. 33

E. 55

4. What is the greatest common factor (GCF) of 18 and 24?

A. 2

B. 3

C. 4

D. 8

E. 6

5. If a pattern continues: 64, 32, 16, 8, ___, what is the next number?

A. 0

B. 4

C. 2

D. 6

E. 1

6. A recipe calls for 3 cups of milk to make 24 pancakes. How many cups of milk are needed for 40 pancakes?

A. 5

B. 6

C. 4

D. 7

E. 8

7. What is 3/5 + 1/5?

A. 4/10

B. 3/5

C. 4/5

D. 2/5

E. 1

8. Round 7,851 to the nearest hundred.

A. 7,800

B. 7,850

C. 8,000

D. 7,900

E. 8,100

9. A bag contains 5 red balls and 10 blue balls. What is the probability of selecting a blue ball?

A. 1/3

B. 1/2

C. 5/15

D. 10/15

E. 2/3

10. What is 25% of 160?

A. 25

B. 40

C. 60

D. 80

E. 100

11. If $6y - 12 = 30$, then $y =$

A. 3

B. 5

C. 7

D. 9

E. 18

12. A store sells notebooks for $1.50 each. How much do 8 notebooks cost?

A. $8.00

B. $10.50

C. $15.00

D. $12.00

E. $9.50

13. What is $10^2 - 8^2$?

A. 36

B. 2

C. 4

D. 16

E. 100

14. If $x < 40$ and $x > 35$, which could NOT be the value of x?

A. 36

B. 37.5

C. 39

D. 38

E. 35

15. What is the least common multiple (LCM) of 6 and 9?

A. 3

B. 18

C. 54

D. 27

E. 36

16. A rectangle has a length of 12 and a width of 5. What is its area?

A. 34

B. 17

C. 120

D. 60

E. 24

17. What is 9/10 − 3/10?

A. 6/10

B. 12/10

C. 9/20

D. 3/5

E. 1/2

18. If $15 \times k = 180$, then k =

A. 165

B. 11

C. 12

D. 195

E. 10

19. A number is multiplied by 3, then 5 is added. The result is 26. What is the number?

A. 10

B. 9

C. 8

D. 6

E. 7

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

A. 15

B. 16

C. 25

D. 12

E. 20

21. What is 30% of 90?

A. 30

B. 20

C. 25

D. 27

E. 35

22. A triangle has a base of 8 and a height of 9. What is its area?

A. 36

B. 17

C. 72

D. 18

E. 32

23. If the pattern continues: 7, 14, 28, 56, ___, what is the next number?

A. 84

B. 70

C. 112

D. 64

E. 100

24. What is $18 + 3^2 - 5$?

A. 20

B. 25

C. 16

D. 14

E. 22

25. A pizza is cut into 16 equal slices. If 6 slices are eaten, what fraction remains?

A. 6/16

B. 10/16

C. 3/8

D. 5/8

E. ½

ANSWERS AND EXPLANATIONS

Quantitative

1. C: 12 - Divide 144 by 12: 144 ÷ 12 = 12. This is a basic division fact from the 12 times table. You can check by multiplying: 12 × 12 = 144 ✓ Knowing multiplication facts helps solve division problems quickly.

2. E: 53 - Solve n − 18 = 35 by adding 18 to both sides: n = 35 + 18 = 53. Check: 53 − 18 = 35 ✓ To undo subtraction, use addition (the inverse operation).

3. B: 26 - The sequence adds 7 each time. 1st number: 5. 2nd number: 5 + 7 = 12. 3rd number: 12 + 7 = 19. 4th number: 19 + 7 = 26. This is an arithmetic sequence with a common difference of 7.

4. A: 63 - Area of a rectangle = length × width = 9 × 7 = 63 square units. Don't confuse with perimeter, which would be 2(9 + 7) = 32. Area measures the space inside, always in square units.

5. D: 16 - Solve 3x = 48 by dividing both sides by 3: x = 48 ÷ 3 = 16. Check: 3 × 16 = 48 ✓ Division is the inverse of multiplication, so to undo multiplication by 3, divide by 3.

6. C: 18 - If 2/5 of 30 students are girls, then the remaining 3/5 are boys (since 5/5 − 2/5 = 3/5). Calculate: (3/5) × 30 = (30 ÷ 5) × 3 = 6 × 3 = 18 boys. Alternatively, find girls first: (2/5) × 30 = 12 girls, then 30 − 12 = 18 boys.

7. E: 45 - Follow the order of operations (PEMDAS). Multiply first: 5 × 4 = 20. Then add: 25 + 20 = 45. Don't work left to right without considering order of operations—multiplication must be done before addition.

8. B: 1/3 - A standard die has faces numbered 1 through 6. Numbers greater than 4 are: 5 and 6 (that's 2 numbers out of 6 possible outcomes). Probability = 2/6 = 1/3 when simplified. Always count favorable outcomes over total possible outcomes.

9. A: 3/4 - Convert 0.75 to a fraction: 0.75 = 75/100. Simplify by dividing both numerator and denominator by their GCF of 25: 75 ÷ 25 = 3 and 100 ÷ 25 = 4, giving 3/4. Check: 3 ÷ 4 = 0.75 ✓

10. D: 12 - The diameter of a circle is twice the radius. If radius = 6, then diameter = 2 × 6 = 12. Remember: diameter goes all the way across the circle through the center, while radius goes from center to edge (halfway across).

11. C: 6 - Solve 4y + 8 = 32 in two steps. Subtract 8 from both sides: 4y = 24. Divide both sides by 4: y = 6. Check: 4(6) + 8 = 24 + 8 = 32 ✓

12. E: $30 - Calculate 25% off of $40. Method 1: Find discount: $0.25 \times \$40 = \$10$, then subtract: $\$40 - \$10 = \$30$. Method 2: If 25% off, you pay 75%: $0.75 \times \$40 = \$30$. Both methods give the sale price of $30.

13. B: 32 - Calculate each exponent first, then subtract. $9^2 = 9 \times 9 = 81$. Then $7^2 = 7 \times 7 = 49$. Finally subtract: $81 - 49 = 32$. Don't subtract first ($9 - 7 = 2$) then square—exponents must be calculated before subtraction according to order of operations.

14. A: 56 - The shaded region is the area between the outer rectangle and inner rectangle. Outer rectangle area: $10 \times 8 = 80$. Inner rectangle area: $6 \times 4 = 24$. Shaded area = outer − inner = $80 - 24 = 56$ square units. The shaded area is like a picture frame around the inner rectangle.

15. D: 30 - The compound inequality $b > 25$ and $b < 30$ means b must be greater than 25 AND less than 30. This is a "could NOT" question, so we're looking for what violates the condition. 30 does NOT satisfy $b < 30$ (30 is not less than 30; it's equal). All other choices (26, 27.5, 29, 28) fall between 25 and 30.

16. C: 3 - Set up a proportion: 2 cups/12 cookies = x cups/18 cookies. Cross-multiply: $2 \times 18 = 12 \times x$, so $36 = 12x$. Divide: x = 3 cups. Or use unit rate: 2 cups makes 12 cookies, so each cookie needs $2/12 = 1/6$ cup. For 18 cookies: $18 \times (1/6) = 3$ cups.

17. E: 1/2 - When subtracting fractions with the same denominator, keep the denominator and subtract numerators: $5/8 - 1/8 = (5 - 1)/8 = 4/8$. Simplify by dividing both by 4: $4/8 = 1/2$.

18. B: 3,460 - When rounding to the nearest ten, look at the ones digit. In 3,456, the ones digit is 6. Since $6 \geq 5$, round up: increase the tens digit from 5 to 6, making 3,460. If the ones digit were less than 5, you'd round down to 3,450.

19. A: 20 - The LCM is the smallest number both numbers divide into evenly. List multiples: 4: 4, 8, 12, 16, 20, 24... and 10: 10, 20, 30... The first common multiple is 20. Verify: $20 \div 4 = 5$ ✓ and $20 \div 10 = 2$ ✓

20. D: 32 - Examine the pattern: 2 to 4 is ×2, 4 to 8 is ×2, 8 to 16 is ×2. Each number doubles to get the next. This is a geometric sequence with a common ratio of 2. To find the next: $16 \times 2 = 32$.

21. C: 60 - Area of a triangle = (base × height) ÷ 2 = $(10 \times 12) \div 2 = 120 \div 2 = 60$ square units. You can also use the formula $A = \frac{1}{2}bh$. A triangle's area is always half the area of a rectangle with the same base and height (because you can fit two identical triangles into that rectangle).

22. E: 30 - To find 15% of 200, multiply: $0.15 \times 200 = 30$. Mental math: 10% of 200 is 20, and 5% of 200 is 10, so 15% = 20 + 10 = 30. Alternatively, 15% = 15/100, so $(15/100) \times 200 = 30$.

23. B: 12 - Solve $12 \times p = 144$ by dividing both sides by 12: $p = 144 \div 12 = 12$. Check: $12 \times 12 = 144$ ✓ This uses the 12 times table fact that $12^2 = 144$.

24. A: 50 - Work backwards from the result. If the result is 7 after subtracting 3, then before subtracting the value was $7 + 3 = 10$. If dividing by 5 gave 10, the original number was $10 \times 5 = 50$. Check: $50 \div 5 = 10$, then $10 - 3 = 7$ ✓

25. D: 6 - The ratio 3:2 means for every 3 apples, there are 2 oranges. If there are 9 apples, find how many groups of 3: $9 \div 3 = 3$ groups. Each group has 2 oranges, so total oranges $= 3 \times 2 = 6$. You can also set up a proportion: $3/2 = 9/x$, cross multiply: $3x = 18$, so $x = 6$.

Reading

1. C: 25% - The passage explicitly states in the first paragraph: "Despite covering less than 1% of the ocean floor, reefs provide habitat for approximately 25% of all marine species." This statistic emphasizes the incredible biodiversity concentration in coral reefs.

2. A: tiny animals - Paragraph 2 clearly states: "Coral may look like colorful rocks, but they're actually tiny animals called polyps that live in colonies." The passage corrects the common misconception that coral is a plant or rock.

3. E: mutually beneficial - Paragraph 3 describes the relationship: "The algae provide food through photosynthesis, while the coral provides shelter." This describes a symbiotic relationship where both organisms benefit—the algae get protection, the coral gets food.

4. B: coral expels its algae - The final paragraph explains: "Rising ocean temperatures cause coral bleaching—when stressed coral expels its algae, turning white and often dying." The expulsion of algae causes the white appearance.

5. D: 50 years - The passage ends with: "Scientists estimate that without protection, most reefs could disappear within 50 years." This timeframe emphasizes the urgency of conservation efforts.

6. A: difficulty concentrating due to family stress - Emma's internal thoughts reveal: "That her parents were getting divorced? That she'd been staying up late hearing them argue? That she couldn't concentrate on anything, let alone equations?" Her family situation is preventing concentration.

7. C: understanding - Mrs. Chen's voice is described as "gentle," she says "I know this isn't like you," and she offers support rather than criticism. Her entire demeanor shows understanding and compassion.

8. E: she finds it difficult to talk about - The passage states: "Emma's throat tightened. How could she explain?" She struggles emotionally to articulate what's happening, not because she doesn't trust or is embarrassed, but because it's emotionally difficult.

9. B: suggesting counseling and a retake - Mrs. Chen explicitly offers: "Would it help to talk to the school counselor? And I can give you extra time to retake this test." She provides both emotional support resources and academic accommodation.

10. D: asking for help shows strength - The passage concludes: "Maybe asking for help wasn't giving up. Maybe it was the bravest thing she could do." Emma realizes that seeking help is courageous, not weak.

11. E: 18 months - The passage opens with: "The Pony Express was a mail delivery service that operated for only 18 months, from April 1860 to October 1861." This is explicitly stated.

12. C: 10 days - Paragraph 2 states: "The entire journey took just 10 days, compared to several weeks by stagecoach." This dramatically fast delivery was revolutionary for the time.

13. B: 10 to 15 miles - The passage specifies: "Riders changed horses every 10 to 15 miles at relay stations." This frequent horse changing kept the pace fast—fresh horses could gallop at full speed.

14. D: the telegraph was completed - The passage explains: "The Pony Express ended when the transcontinental telegraph was completed, making instant communication possible." Technology made the horse relay system obsolete.

15. A: the work was extremely dangerous - The advertisement stated riders must be "willing to risk death daily" and "Orphans preferred" suggests the danger was so high that having no family was actually preferred, showing the extreme risk involved.

16. C: explain how photosynthesis works - The passage systematically explains the photosynthesis process: what it is, where it occurs, what materials are needed, what's produced, and why it matters. This is clearly an explanatory passage about the process.

17. E: capture sunlight - Paragraph 2 states: "leaves contain chlorophyll, a green pigment that captures sunlight." While chlorophyll makes leaves green, its function is capturing light energy.

18. D: carbon dioxide and water - The passage explicitly states: "plants take in carbon dioxide from the air and water from the soil." These are the two inputs (along with sunlight) for photosynthesis.

19. A: respiration - Paragraph 3 directly states: "This process is essentially the opposite of respiration, which animals use to convert glucose and oxygen back into energy, carbon dioxide, and water."

20. B: life on Earth couldn't exist as it does - The final paragraph states: "Without photosynthesis, life on Earth as we know it couldn't exist." The passage explains plants form food chain foundations and produce essential oxygen.

21. D: a passenger - The passage states: "In 1928, Earhart became the first woman to fly across the Atlantic Ocean as a passenger. Though she didn't pilot the plane herself, the achievement made her famous."

22. E: flying solo across the Atlantic - Paragraph 2 continues: "Unsatisfied with being just a passenger, she became the first woman to fly solo across the Atlantic in 1932, proving she was a skilled pilot in her own right."

23. C: advocating for women's rights - Paragraph 3 states: "Earhart used her fame to advocate for women's rights and opportunities. She believed women could do anything men could do if given the chance."

24. A: fly around the world - The final paragraph explains: "In 1937, Earhart attempted to fly around the world at the equator—a journey of 29,000 miles. She and her navigator, Fred Noonan, disappeared over the Pacific Ocean."

25. B: courage and inspiration - The passage concludes: "Despite the tragic end, Earhart's courage and achievements continue to inspire people today." Her legacy is defined by bravery and inspiration, not just tragedy.

26. E: 44,000 miles - Paragraph 2 states: "Arctic terns hold the record for the longest migration, traveling about 44,000 miles annually from Arctic to Antarctic and back." This is an incredible distance.

27. A: Canada and Mexico - The passage specifies: "Monarch butterflies, despite their delicate appearance, migrate up to 3,000 miles from Canada to Mexico." This is one of the most famous migrations.

28. A: compasses - This is an EXCEPT question. Paragraph 3 lists navigation methods: "Some use the sun or stars for direction. Others follow Earth's magnetic field. Many birds use landmarks like rivers and mountains." Compasses (human-made tools) are not mentioned.

29. C: climate change - Paragraph 4 states: "Climate change is also disrupting traditional migration patterns as temperatures and seasons shift." The passage identifies this as a modern threat to migration.

30. B: the benefits are worth the dangers - The final paragraph concludes: "migration continues because the benefits outweigh the risks. Access to abundant food, better weather, and safe breeding grounds makes the dangerous journey worthwhile."

31. E: Maya vs. herself and her anger - While there's conflict with Jamal, the main struggle is Maya's internal battle between anger and forgiveness. She must overcome her frustration to forgive him.

32. C: she remembers he forgave her once - The passage states: "But looking at Jamal's devastated face, she remembered when she'd accidentally deleted his favorite video game save file. He'd forgiven her." This memory prompts her forgiveness.

33. D: valuing relationships - The teacher's response emphasizes: "the most important projects aren't the ones we turn in, but the relationships we build while creating them." The lesson is about prioritizing people over perfection.

34. A: imperfect but completed with help - The passage describes: "The rebuilt volcano wasn't as perfect as the original. The paint job was rushed, and one side leaned slightly." But they finished it together through teamwork.

35. B: learning from challenges - The teacher "praised not the volcano but what she'd learned" about relationships and overcoming adversity. The value is in the growth, not the perfect product.

36. B: 86 billion neurons - The opening sentence states: "The human brain is the most complex organ in the body, containing approximately 86 billion neurons." This specific number is clearly stated.

37. D: thinking and voluntary movement - Paragraph 2 explains: "The cerebrum, the largest part, handles thinking, memory, and voluntary movement." This distinguishes it from automatic functions controlled by other brain regions.

38. B: 20% of energy - Paragraph 3 states: "Interestingly, the brain uses about 20% of the body's energy despite being only 2% of body weight." This shows the brain's enormous energy demands.

39. A: adapt and form new connections - Paragraph 4 explains neuroplasticity: "When one area is damaged, other parts can sometimes take over its functions. Learning new skills creates new neural connections." This describes the brain's adaptability.

40. C: consciousness - The final paragraph states: "Scientists still don't fully understand how the brain creates consciousness, emotion, and personality." While we understand physical functions, consciousness remains mysterious.

Verbal

1. B: shy - Timid and shy both mean lacking confidence or courage, hesitant to take action. "A timid child" and "a shy child" describe someone who is nervous around others or in new situations. Both indicate fearfulness or lack of boldness.

2. E: serious - Solemn and serious both mean grave, sober, or characterized by deep sincerity. "A solemn ceremony" and "a serious ceremony" describe formal, dignified events. Both indicate a lack of levity or frivolity.

3. A: inform - Notify and inform both mean to give notice or tell someone about something, to communicate information. "Please notify me when you arrive" means the same as "Please inform me when you arrive." Both indicate conveying information.

4. D: roomy - Spacious and roomy both mean having ample space, not cramped or confined. "A spacious apartment" and "a roomy apartment" describe living quarters with plenty of room. Both emphasize generous size or area.

5. C: care - Caution and care both mean attention to avoid danger or mistakes, prudence or wariness. "Use caution when crossing" means the same as "Use care when crossing." Both indicate being careful and alert to potential hazards.

6. E: icy - Frigid and icy both mean extremely cold, freezing. "Frigid weather" and "icy weather" describe the same very cold conditions. Both emphasize intense, bitter coldness.

7. B: short - Brief and short both mean lasting for a small amount of time, not long. "A brief meeting" and "a short meeting" describe the same quick gathering. Both indicate limited duration.

8. A: suffering - Distress and suffering both mean pain, anxiety, or sorrow, great physical or emotional discomfort. "The family's distress" and "the family's suffering" describe the same anguish. Both indicate experiencing hardship or pain.

9. D: agile - Nimble and agile both mean quick and light in movement, able to move easily and quickly. "A nimble dancer" and "an agile dancer" describe someone who moves with grace and speed. Both indicate dexterity and quickness.

10. C: clear - Obvious and clear both mean easily perceived or understood, not hidden or ambiguous. "The answer is obvious" means the same as "The answer is clear." Both indicate something readily apparent or understandable.

11. B: panicked - Frantic and panicked both mean wildly anxious or agitated, in a state of extreme worry or fear. "A frantic search" and "a panicked search" describe the same desperate, hurried effort. Both indicate extreme anxiety or urgency.

12. E: honorable - Noble and honorable both mean having high moral qualities, showing admirable character or purpose. "A noble deed" and "an honorable deed" describe the same virtuous action. Both indicate ethical excellence or dignity.

13. A: decrease - Dwindle and decrease both mean to become smaller or less, to diminish gradually. "Resources dwindle" means the same as "Resources decrease." Both indicate reduction in size, amount, or intensity.

14. C: endure - Tolerate and endure both mean to allow something unpleasant to continue without interference, to bear or put up with. "I can't tolerate the noise" means roughly the same as "I can't endure the noise." Both indicate accepting or bearing something difficult.

15. D: extravagant - Lavish and extravagant both mean characterized by excessive spending or abundance, luxurious and costly. "A lavish party" and "an extravagant party" describe the same opulent, expensive celebration. Both indicate abundance and luxury beyond normal limits.

16. B: argue - Dispute and argue both mean to engage in disagreement or debate, to contest or challenge. "They disputed the decision" means the same as "They argued about the decision." Both indicate verbal disagreement or controversy.

17. E: courteous - Gracious and courteous both mean polite, kind, and pleasant in manner. "A gracious host" and "a courteous host" describe someone who treats guests with warmth and respect. Both indicate refined politeness and consideration.

18. A: twist - Distort and twist both mean to alter the original form or meaning, to misrepresent or contort. "Distort the facts" and "twist the facts" both mean to change truth into something misleading. Both indicate deformation or misrepresentation.

19. D: energy - Vigor and energy both mean physical or mental strength, vitality and force. "He worked with vigor" means the same as "He worked with energy." Both indicate active strength and enthusiasm.

20. C: sudden - Abrupt and sudden both mean happening quickly and unexpectedly, without warning. "An abrupt change" and "a sudden change" describe the same rapid, unforeseen shift. Both emphasize unexpectedness and speed.

21. E: isolate - Seclude and isolate both mean to set apart from others, to separate or withdraw into solitude. "Seclude yourself" and "isolate yourself" both mean to remove yourself from others. Both indicate separation or withdrawal.

22. B: inactive - Dormant and inactive both mean not active or functioning, in a state of rest or suspension. "A dormant volcano" is one that's currently inactive but could become active. Both indicate a temporary state of non-activity.

23. D: courageous - Valiant and courageous both mean possessing or showing bravery, heroically bold. "A valiant effort" and "a courageous effort" describe the same brave attempt. Both indicate fearless determination.

24. A: threat - Menace and threat both mean something that poses danger or harm, a source of peril. "A menace to society" and "a threat to society" describe the same dangerous element. Both indicate potential harm or danger.

25. C: fragile - Brittle and fragile both mean easily broken or damaged, not resilient. "Brittle glass" and "fragile glass" describe material that breaks easily. Both indicate susceptibility to breaking or damage.

26. E: disdain - Scorn and disdain both mean contempt or derision, the feeling that someone or something is worthless. "Treat with scorn" and "treat with disdain" both mean to show contempt. Both indicate strong disapproval or contempt.

27. B: peaceful - Tranquil and peaceful both mean calm and quiet, free from disturbance or turmoil. "A tranquil lake" and "a peaceful lake" describe the same serene, undisturbed water. Both indicate calmness and serenity.

28. D: consider - Ponder and consider both mean to think about carefully, to contemplate or reflect on. "Ponder the question" and "consider the question" both mean to think deeply about it. Both indicate thoughtful reflection.

29. A: bravery - Valor and bravery both mean courage in the face of danger, heroic boldness. "He showed great valor" means the same as "He showed great bravery." Both indicate courageous behavior, especially in battle or danger.

30. C: bright - Radiant and bright both mean shining or glowing with light, emitting or reflecting much light. "A radiant smile" and "a bright smile" both describe a brilliant, luminous expression. Both indicate emitting or reflecting light, often used figuratively for happiness.

31. C: knife is to cut - Relationship: Tool to its primary function. A pencil is used to write, just as a knife is used to cut. Both show objects paired with their main purpose or use.

32. E: caterpillar is to butterfly - Relationship: Larval form to adult form. A tadpole develops into a frog, just as a caterpillar develops into a butterfly. Both show immature stages that transform into completely different-looking adults through metamorphosis.

33. B: scale is to weight - Relationship: Measuring instrument to what it measures. A thermometer measures temperature, just as a scale measures weight. Both show devices paired with the specific quantity they measure.

34. D: petal is to flower - Relationship: Part to whole (visible outer component). A blossom is the flowering part of a tree, just as a petal is a component part of a flower. Both show showy, colorful parts of plants.

35. A: grateful is to gift - Relationship: Emotion to what causes it. Feeling proud is a natural response to achievement, just as feeling grateful is a natural response to receiving a gift. Both show emotions paired with their typical triggers.

36. C: composer is to symphony - Relationship: Creator to their creation. An architect designs a building, just as a composer creates a symphony. Both show artists paired with the works they create.

37. E: tiptoe is to stomp - Relationship: Quiet/gentle action to loud/forceful opposite. Whispering is speaking softly while shouting is speaking loudly; tiptoeing is walking quietly while stomping is walking loudly. Both contrast gentle actions with their forceful opposites.

38. B: scene is to play - Relationship: Subdivision to whole work. A chapter is a division of a book, just as a scene is a division of a play. Both show how larger works are broken into smaller units.

39. D: opaque is to wall - Relationship: Optical property to object possessing it. A window is transparent (you can see through it), just as a wall is opaque (you can't see through it). Both pair materials with their light transmission properties.

40. A: musician is to applause - Relationship: Performer to audience response they evoke. A comedian's goal is to produce laughter, just as a musician's performance produces applause. Both show entertainers paired with the audience reactions they aim to generate.

41. C: brook is to lake - Relationship: Small flowing water to larger still water. A stream is a small flowing water body that may feed into a river (larger flowing water), just as a brook is small flowing water that may feed into a lake (larger still water). Both show progression from small to large water bodies.

42. E: seed is to apple - Relationship: Core/center element to whole. A yolk is at the center of an egg, just as a seed is at the center of an apple. Both show the inner, generative part contained within the whole.

43. B: grin is to joy - Relationship: Facial expression to emotion it indicates. A frown indicates sadness, just as a grin indicates joy. Both show facial expressions paired with the emotions they express.

44. D: cowboy is to cattle - Relationship: Person to animals they tend. A shepherd tends and manages sheep, just as a cowboy tends and manages cattle. Both show caregivers paired with the animals under their supervision.

45. A: plant is to seed - Relationship: Action that initiates to what results. To ignite is to start a fire, just as to plant is to start growth from a seed. Both show initiating actions and what they begin.

46. C: carpenter is to hammer - Relationship: Craftsperson to their primary tool. A sculptor uses a chisel as a primary tool, just as a carpenter uses a hammer. Both show artisans paired with characteristic tools of their trade.

47. E: whisper is to yell - Relationship: Light/gentle version to intense version. A drizzle is light rain while a downpour is heavy rain; a whisper is quiet speech while a yell is loud speech. Both contrast mild and extreme versions of the same type of action.

48. B: seed is to plant - Relationship: Starting form to what grows from it. An acorn is a seed that grows into an oak tree, just as a seed generally grows into a plant. Both show the beginning form and what develops from it.

49. D: dentist is to teeth - Relationship: Medical specialist to body part they treat. An optometrist specializes in treating eyes, just as a dentist specializes in treating teeth. Both show doctors paired with their area of specialization.

50. A: satisfy is to hunger - Relationship: Action that addresses/eliminates to need addressed. To quench is to eliminate thirst, just as to satisfy is to eliminate hunger. Both show verbs that describe fulfilling physical needs.

51. C: twilight is to dusk - Relationship: Time period to its synonym. Dawn and morning both refer to early day (with dawn being the very beginning), just as twilight and dusk both refer to early evening. Both pairs are closely related time periods.

52. E: yacht is to boat - Relationship: Luxurious type to category. A mansion is a large, luxurious type of house, just as a yacht is a large, luxurious type of boat. Both show expensive, elaborate versions of common things.

53. B: eardrum is to ear - Relationship: Key functional component to organ. A lens is the key light-focusing component of an eye, just as an eardrum is the key sound-receiving component of an ear. Both show critical parts within sensory organs.

54. D: hurricane is to wind - Relationship: Storm type to primary element. A blizzard is characterized primarily by heavy snow, just as a hurricane is characterized primarily by strong wind. Both show weather phenomena paired with their defining elements.

55. A: apprentice is to expert - Relationship: Beginner to experienced professional. A recruit is someone new to being a soldier, just as an apprentice is someone learning to become an expert. Both show people at the start of their professional development.

56. C: school is to fish - Relationship: Collective noun for group to animal. A flock is the term for a group of birds, just as a school is the term for a group of fish. Both show specialized collective nouns for animal groups. (Note: All choices are correct collective nouns, but school-fish matches the structure best.)

57. E: revolve is to moon - Relationship: Movement pattern to object that performs it. Planets orbit (move in a circular path around) the sun, just as the moon revolves (moves in a circular path around) Earth. Both show celestial bodies and their characteristic motion.

58. B: island is to ocean - Relationship: Isolated feature within larger environment. An oasis is an isolated fertile spot in a desert, just as an island is an isolated land mass in an ocean. Both show rare, distinct features within vast, uniform surroundings.

59. D: roots is to tree - Relationship: Stabilizing/anchoring structure to what it secures. An anchor holds a ship in place, just as roots hold a tree in place. Both show structures that prevent movement and provide stability.

60. A: friendly is to ally - Relationship: Typical attitude toward to type of person. One typically feels hostile toward an enemy, just as one typically feels friendly toward an ally. Both show attitudes paired with the relationships that naturally evoke them.

Quantitative

1. D: 8 - Solve $72 ÷ x = 9$ by rearranging: $x = 72 ÷ 9 = 8$. Check: $72 ÷ 8 = 9$ ✓ When dividing equals a number, multiply that number by the divisor to find the dividend.

2. A: 5 - Follow order of operations (PEMDAS). Multiply first: $3 × 4 = 12$. Then work left to right: $15 − 12 = 3$, then $3 + 2 = 5$. Don't work strictly left to right—multiplication comes before addition and subtraction.

3. C: 44 - A square has four equal sides. Perimeter $= 4 ×$ side $= 4 × 11 = 44$. Don't confuse with area, which would be $11 × 11 = 121$. Perimeter is the distance around the outside.

4. E: 6 - The GCF is the largest number that divides evenly into both. Factors of 18: 1, 2, 3, 6, 9, 18. Factors of 24: 1, 2, 3, 4, 6, 8, 12, 24. Common factors: 1, 2, 3, 6. The greatest is 6. Check: $18 ÷ 6 = 3$ and $24 ÷ 6 = 4$.

5. B: 4 - Examine the pattern: 64 to 32 is ÷2, 32 to 16 is ÷2, 16 to 8 is ÷2. Each number is divided by 2. This is a geometric sequence with ratio 1/2. Next number: $8 ÷ 2 = 4$.

6. A: 5 - Set up a proportion: 3 cups/24 pancakes = x cups/40 pancakes. Cross-multiply: $3 × 40 = 24 × x$, so $120 = 24x$. Divide: $x = 5$ cups. Or find cups per pancake: $3/24 = 1/8$ cup per pancake, so $40 × (1/8) = 5$ cups.

7. C: 4/5 - When adding fractions with the same denominator, keep the denominator and add numerators: $3/5 + 1/5 = (3 + 1)/5 = 4/5$. The denominator stays 5; only the numerators are added.

8. D: 7,900 - When rounding to the nearest hundred, look at the tens digit. In 7,851, the tens digit is 5. Since $5 \geq 5$, round up: increase the hundreds digit from 8 to 9, making 7,900.

9. E: 2/3 - Total balls: 5 red + 10 blue = 15 balls. Probability of blue = blue balls/total balls = 10/15. Simplify by dividing both by 5: $10/15 = 2/3$. Always reduce fractions to simplest form.

10. B: 40 - To find 25% of 160, multiply: $0.25 \times 160 = 40$. Mental math: 25% = 1/4, so $160 \div 4 = 40$. Or: 10% of 160 is 16, so 25% is 2.5 times that: $16 \times 2.5 = 40$.

11. C: 7 - Solve $6y - 12 = 30$ in two steps. Add 12 to both sides: $6y = 42$. Divide both sides by 6: $y = 7$. Check: $6(7) - 12 = 42 - 12 = 30$ ✓

12. D: $12.00 - Multiply price per notebook by quantity: $\$1.50 \times 8 = \$12.00$. You can think of this as $\$1.50 \times 8 = \$1 \times 8 + \$0.50 \times 8 = \$8 + \$4 = \$12$.

13. A: 36 - Calculate each exponent first, then subtract. $10^2 = 100$ and $8^2 = 64$. Then: $100 - 64 = 36$. Don't subtract first ($10 - 8 = 2$) then square—exponents must be calculated before subtraction.

14. E: 35 - The compound inequality $x < 40$ and $x > 35$ means x must be greater than 35 AND less than 40. This is a "could NOT" question. 35 does NOT satisfy $x > 35$ (35 is not greater than 35; it's equal). All other choices fall between 35 and 40.

15. B: 18 - The LCM is the smallest number both numbers divide into evenly. List multiples: 6: 6, 12, 18, 24... and 9: 9, 18, 27... The first common multiple is 18. Verify: $18 \div 6 = 3$ ✓ and $18 \div 9 = 2$ ✓

16. D: 60 - Area of a rectangle = length × width = $12 \times 5 = 60$ square units. Don't confuse with perimeter, which would be $2(12 + 5) = 34$. Area measures the space inside.

17. A: 6/10 - When subtracting fractions with the same denominator, keep the denominator and subtract numerators: $9/10 - 3/10 = (9 - 3)/10 = 6/10$. This can be simplified to 3/5 by dividing both by 2, but 6/10 is shown in the choices.

18. C: 12 - Solve $15 \times k = 180$ by dividing both sides by 15: $k = 180 \div 15 = 12$. Check: $15 \times 12 = 180$ ✓ You can think "15 times what equals 180?"

19. E: 7 - Work backwards or set up an equation. Let n be the number: $(n \times 3) + 5 = 26$. So $3n + 5 = 26$. Subtract 5: $3n = 21$. Divide by 3: $n = 7$. Check: $7 \times 3 = 21$, then $21 + 5 = 26$ ✓

20. B: 16 - The ratio 5:4 means for every 5 cats, there are 4 dogs. If there are 20 cats, find how many groups of 5: $20 \div 5 = 4$ groups. Each group has 4 dogs, so total dogs = $4 \times 4 = 16$. Or proportion: $5/4 = 20/x$, cross multiply: $5x = 80$, so $x = 16$.

21. D: 27 - To find 30% of 90, multiply: $0.30 \times 90 = 27$. Mental math: 10% of 90 is 9, so 30% is 3 times that: $3 \times 9 = 27$. Alternatively, 30% = 3/10, so $(3/10) \times 90 = 27$.

22. A: 36 - Area of a triangle = (base × height) ÷ 2 = $(8 \times 9) \div 2 = 72 \div 2 = 36$ square units. You can also use formula $A = \frac{1}{2}bh$. A triangle's area is always half that of a rectangle with the same base and height.

23. C: 112 - Examine the pattern: 7 to 14 is ×2, 14 to 28 is ×2, 28 to 56 is ×2. Each number doubles. This is a geometric sequence with ratio 2. Next number: $56 \times 2 = 112$.

24. E: 22 - Follow order of operations. Calculate the exponent first: $3^2 = 9$. Then work left to right: $18 + 9 = 27$, then $27 - 5 = 22$. Exponents are calculated before addition and subtraction.

25. B: 10/16 - If 6 slices out of 16 are eaten, then $16 - 6 = 10$ slices remain. Fraction remaining = 10/16. This can be simplified to 5/8 by dividing both by 2, but 10/16 is the answer shown in the choices.