MIDDLE LEVEL SSAT PRACTICE TEST 6

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: Every year on your birthday, you receive an anonymous gift that's always exactly what you need most—even if you didn't know you needed it. This year, the gift is something you definitely weren't expecting.

Topic B: Describe a moment when you stood up for something you believed in, even though it was difficult or unpopular. What gave you the courage to take that stand? How did the experience change you?

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 273 ÷ 21?

A. 12

B. 14

C. 11

D. 13

E. 15

2. If p + 43 = 98, then p =

A. 55

B. 43

C. 98

D. 141

E. 88

3. A sequence follows the rule: subtract 8 from the previous number. If the first number is 75, what is the 6th number?

A. 43

B. 51

C. 35

D. 67

E. 27

4. What is the area of a rectangle with length 23 and width 8?

A. 31

B. 62

C. 160

D. 180

E. 184

5. If $17x = 221$, then $x =$

A. 204

B. 13

C. 238

D. 17

E. 12

6. A group has 96 members. If 7/12 of them are female, how many are female?

A. 84

B. 40

C. 48

D. 56

E. 72

7. What is $63 - 9 \times 5 + 12$?

A. 30

B. 282

C. 60

D. 270

E. 24

8. A spinner has 20 equal sections numbered 1 through 20. What is the probability of landing on a multiple of 4?

A. 4/20

B. 5/20

C. 1/4

D. 1/5

E. 4/5

9. Which of the following is equivalent to 0.85?

A. 85/10

B. 8/5

C. 1/85

D. 85/1000

E. 17/20

10. A circle has a diameter of 42. What is its radius?

A. 84

B. 21

C. 42

D. 10.5

E. 63

11. If $9y + 19 = 82$, then $y =$

A. 63

B. 19

C. 101

D. 7

E. 9

12. A laptop originally costs $240. It's now on sale for 35% off. What is the sale price?

A. $156

B. $84

C. $205

D. $180

E. $120

13. What is $23^2 - 20^2$?

A. 3

B. 129

C. 129

D. 400

E. 529

14. If $r > 125$ and $r < 130$, which could NOT be the value of r?

A. 126

B. 128.5

C. 127

D. 129

E. 130

15. A recipe requires 9 cups of milk to make 15 servings. How many cups are needed for 25 servings?

A. 13

B. 15

C. 18

D. 12

E. 20

16. What is 17/23 − 9/23?

A. 26/23

B. 9/23

C. 8/46

D. 8/23

E. 17/46

17. Round 11,482 to the nearest ten.

A. 11,480

B. 11,490

C. 11,500

D. 11,400

E. 11,470

18. What is the least common multiple (LCM) of 18 and 24?

A. 6

B. 432

C. 72

D. 36

E. 48

19. If the pattern continues: 7, 21, 63, 189, ___, what is the next number?

A. 196

B. 252

C. 378

D. 441

E. 567

20. A triangle has a base of 30 and a height of 21. What is its area?

A. 51

B. 315

C. 630

D. 102

E. 420

21. What is 75% of 160?

A. 75

B. 110

C. 100

D. 120

E. 140

22. If $21 \times v = 273$, then $v =$

A. 13

B. 21

C. 12

D. 14

E. 252

23. A number is divided by 7, then 11 is added. The result is 19. What is the number?

A. 133

B. 210

C. 56

D. 63

E. 49

24. The ratio of pencils to pens in a desk is 4:9. If there are 36 pencils, how many pens are there?

A. 40

B. 72

C. 63

D. 54

E. 81

25. What is $35 + 8^2 - 14$?

A. 79

B. 85

C. 57

D. 50

E. 64

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

Most people use the terms "meteor," "meteoroid," and "meteorite" interchangeably, but they describe different stages of the same space object. Understanding the difference is simple once you know what to look for.

A meteoroid is a piece of rock or metal floating in space, ranging from dust-sized particles to objects several feet across. Millions of meteoroids orbit the Sun, left over from the formation of the solar system or broken off from comets and asteroids. Most are tiny, but occasionally larger ones cross Earth's path.

When a meteoroid enters Earth's atmosphere, friction with air molecules heats it to thousands of degrees. The object begins to glow, creating a bright streak of light across the sky—what we call a meteor, or "shooting star." Most meteors burn up completely before reaching the ground, disintegrating at altitudes of 50 to 75 miles above Earth.

However, if a meteor survives its fiery journey through the atmosphere and lands on Earth, it becomes a meteorite. Scientists study meteorites to learn about the early solar system since these rocks have remained largely unchanged for billions of years. Some meteorites contain organic compounds, providing clues about how life's building blocks might have arrived on Earth.

The famous meteor shower events, like the Perseids in August, occur when Earth passes through debris trails left by comets. During these events, dozens or even hundreds of meteors per hour can light up the night sky, though few if any reach the ground as meteorites.

1. A meteoroid becomes a meteor when it

A. enters Earth's atmosphere

B. lands on the ground

C. orbits the Sun

D. forms in space

E. breaks off from a comet

2. Most meteors burn up at approximately

A. 10 miles above Earth

B. 25 miles above Earth

C. 100 miles above Earth

D. 50-75 miles above Earth

E. at ground level

3. Scientists study meteorites to learn about

A. modern weather patterns

B. future asteroid impacts

C. the early solar system

D. current space exploration

E. atmospheric composition

4. Meteor showers occur when

A. asteroids collide

B. the Moon blocks the Sun

C. comets explode

D. planets align

E. Earth passes through comet debris trails

5. If a meteor reaches Earth's surface, it is called a

A. meteoroid

B. meteorite

C. asteroid

D. comet

E. shooting star

Passage 2

The email from the competition organizers arrived during lunch. "Congratulations! You've been selected as a finalist for the National Youth Poetry Award."

I stared at my phone, reading it three times. Out of thousands of entries, they'd chosen me. My poem—the one about my grandmother's immigration journey—would be read at a ceremony in Washington, D.C. With me there. In front of hundreds of people.

My hands started shaking. Not from excitement. From terror.

"What's wrong?" my friend Alicia asked, noticing my expression.

"I got into the poetry finals," I whispered. "But I have to read my poem. Out loud. In front of everyone."

Alicia knew about my stage fright. Last year, I'd literally run off stage during a class presentation, unable to speak. The thought of standing before a microphone, all those eyes watching, made my chest tight.

"So you're going, right?" Alicia said.

"I don't know. Maybe I can submit a recording instead?"

She grabbed my phone, reading the email. "It says finalists must attend and perform. This is huge! You can't miss it because you're scared."

She was right, but that didn't make it easier. I'd written the poem to honor my grandmother, to share her story. She'd crossed an ocean with nothing, learned a new language, built a life in a foreign country. She did terrifying things because they mattered.

Maybe I could too. Not because I wasn't scared—but because the story was bigger than my fear.

6. The narrator has been selected as

A. a finalist for a poetry award

B. a winner of a writing contest

C. a participant in a school play

D. a speaker at a conference

E. a student ambassador

7. The narrator's main concern about attending is

A. the cost of travel

B. missing school

C. being away from family

D. having to perform in front of people

E. competing against others

8. Last year during a class presentation, the narrator

A. won an award

B. forgot their speech

C. ran off stage

D. received applause

E. helped a classmate

9. The narrator's poem is about their grandmother's

A. childhood

B. cooking

C. career

D. hobbies

E. immigration journey

10. By the end of the passage, the narrator decides that

A. they will decline the invitation

B. the story matters more than fear

C. they will ask for a replacement

D. poetry isn't worth the stress

E. they should quit writing

Passage 3

Photosynthesis is one of the most important chemical processes on Earth. Through photosynthesis, plants, algae, and some bacteria convert light energy into chemical energy stored in glucose molecules. This process not only feeds the plants themselves but also produces the oxygen that most living things need to survive.

Photosynthesis occurs primarily in plant leaves, within specialized structures called chloroplasts. These contain chlorophyll, the green pigment that absorbs light energy—primarily red and blue wavelengths. This is why most plants appear green: they reflect green light rather than absorbing it.

The process has two main stages. The light-dependent reactions occur first, using sunlight to split water molecules into hydrogen and oxygen. The oxygen is released into the atmosphere as a byproduct—this is the source of the oxygen we breathe. The light-independent reactions, also called the Calvin cycle, use the hydrogen along with carbon dioxide from the air to build glucose molecules.

The glucose plants create serves multiple purposes. Plants use it immediately for energy or convert it into starch for storage. It also serves as the building block for cellulose, which forms plant cell walls. When animals eat plants, they access this stored energy, making photosynthesis the foundation of nearly all food chains.

Without photosynthesis, Earth's atmosphere would contain almost no oxygen, and complex life as we know it couldn't exist. Every breath you take and nearly every bite of food you eat can be traced back to photosynthesis.

11. Photosynthesis primarily occurs in

A. leaves

B. roots

C. stems

D. flowers

E. bark

12. Chlorophyll primarily absorbs which wavelengths of light?

A. green and yellow

B. orange and purple

C. white and black

D. red and blue

E. all wavelengths equally

13. The oxygen released during photosynthesis comes from

A. carbon dioxide

B. glucose

C. water molecules

D. soil nutrients

E. nitrogen

14. The Calvin cycle is also known as

A. the oxygen cycle

B. the water cycle

C. the carbon cycle

D. the chlorophyll process

E. light-independent reactions

15. According to the passage, photosynthesis is the foundation of

A. Earth's rotation

B. nearly all food chains

C. weather patterns

D. ocean currents

E. plate tectonics

Passage 4

On December 1, 1955, Rosa Parks boarded a bus in Montgomery, Alabama, and took a seat. When a white passenger boarded and the driver demanded she give up her seat and move to the back of the bus, Parks refused. Her arrest that day sparked one of the most significant protests in American civil rights history.

Contrary to popular belief, Parks wasn't simply a tired woman who spontaneously decided to sit down. She was a trained civil rights activist and secretary of the local NAACP chapter. She had attended workshops on nonviolent resistance and had long been involved in fighting segregation. Her refusal was a planned act of civil disobedience.

Parks' arrest triggered the Montgomery Bus Boycott, organized by a young minister named Martin Luther King Jr. For 381 days, African Americans in Montgomery refused to ride city buses, walking miles to work or arranging carpools instead. The boycott cost the bus company significant revenue and drew national attention to segregation in the South.

The boycott ended in victory when the Supreme Court ruled that bus segregation was unconstitutional. But the impact went far beyond Montgomery's buses. The protest demonstrated that organized, sustained, nonviolent resistance could challenge unjust laws. It established King as a national civil rights leader and inspired similar protests across the country.

Parks paid a heavy price for her courage. She received death threats, lost her job, and eventually had to leave Alabama. Yet she never regretted her decision. As she said later, "I had been pushed as far as I could

stand to be pushed. I had decided that I would have to know once and for all what rights I had as a human being and a citizen."

16. Rosa Parks refused to give up her seat in

A. 1955

B. 1965

C. 1945

D. 1963

E. 1968

17. Parks was

A. unaware of civil rights issues

B. acting spontaneously without planning

C. not involved in activism before the incident

D. a trained civil rights activist

E. forced to protest by others

18. The Montgomery Bus Boycott lasted

A. 30 days

B. 100 days

C. 381 days

D. one year exactly

E. two years

19. The boycott was organized by

A. the bus company

B. the Supreme Court

C. Rosa Parks alone

D. the governor

E. Martin Luther King Jr.

20. After her arrest, Rosa Parks

A. became wealthy

B. lost her job

C. moved to Washington

D. stopped activism

E. became governor

Passage 5

Sound is a form of energy that travels through matter in waves. Unlike light, which can travel through empty space, sound requires a medium—solid, liquid, or gas—to propagate. This is why there's no sound in the vacuum of space; astronauts on spacewalks communicate via radio waves, not by shouting.

Sound waves are created by vibrations. When an object vibrates, it causes air molecules around it to compress and expand, creating areas of high and low pressure. These pressure waves spread outward in all directions. When they reach your ear, they vibrate your eardrum, which your brain interprets as sound.

Sound travels at different speeds through different materials. In air at room temperature, sound travels at approximately 767 miles per hour (343 meters per second). However, sound travels faster through water—about four times as fast—and even faster through solids like steel. This happens because molecules in denser materials are packed more tightly together, allowing vibrations to transfer more quickly from one molecule to the next.

We measure sound intensity in decibels (dB). Normal conversation is about 60 dB, while a rock concert might reach 120 dB. The decibel scale is logarithmic, meaning each increase of 10 dB represents a tenfold increase in intensity. Prolonged exposure to sounds above 85 dB can damage hearing permanently.

Understanding sound has practical applications. Architects design concert halls with specific shapes and materials to enhance acoustics. Doctors use ultrasound—sound waves too high-pitched for humans to hear—to see inside the body. Even animals use sound in remarkable ways: bats navigate using echolocation, and whales communicate across entire ocean basins using low-frequency calls.

21. Sound requires what to travel?

A. a medium (solid, liquid, or gas)

B. empty space

C. complete silence

D. darkness

E. extreme heat

22. In air at room temperature, sound travels at approximately

A. 100 mph

B. 500 mph

C. 1,000 mph

D. 767 mph

E. 60 mph

23. Sound travels fastest through

A. air

B. water

C. solids

D. vacuum

E. clouds

24. The decibel scale is

A. linear

B. circular

C. random

D. geometric

E. logarithmic

25. Prolonged exposure to sounds above what level can damage hearing?

A. 60 dB

B. 85 dB

C. 50 dB

D. 100 dB

E. 120 dB

Passage 6

I found the letter tucked inside my great-grandfather's military medal—a Purple Heart from World War II. The envelope was yellowed, the handwriting elegant but fading. It was addressed to "My dearest Anna" and dated August 1944, just weeks before he was wounded in France.

I'd never met him—he died decades before I was born. But my grandmother Anna, his daughter, was still alive. I called her immediately.

"You found it?" Her voice cracked. "I knew he wrote to my mother, but I thought all the letters were lost."

I started to read it aloud: "My dearest Anna, I write this not knowing if I'll see you again. War changes a man, but my love for you and our daughter remains unchanged. If I don't return, please tell our Anna about me—not the soldier, but the man who loved teaching history, who couldn't carry a tune but sang anyway, who believed the world was worth fighting for."

I heard Grandma crying softly on the other end.

"He did come back," she whispered. "But he wasn't the same. He had nightmares, didn't talk much about the war. I always wondered what he was like before—the man my mother fell in love with."

"This letter shows that man," I said. "He's still there, in these words."

"Read it again," she asked. "Please. I want to hear my father's voice."

So I did, slowly this time. And in a yellowed letter written eight decades ago, a man spoke to his family again—reminding us that love outlasts even the longest silence.

26. The narrator found the letter inside

A. a military medal

B. a book

C. a desk drawer

D. an album

E. a trunk

27. The letter was written in

A. 1950

B. 1945

C. 1942

D. 1944

E. 1941

28. The narrator's great-grandfather was wounded in

A. Germany

B. Italy

C. France

D. England

E. Belgium

29. The grandmother had believed

A. her father never wrote letters

B. the letters still existed somewhere

C. her father disliked writing

D. no one cared about the past

E. all the letters were lost

30. By the end, the narrator realizes the letter

A. should be thrown away

B. allows the great-grandfather to speak again

C. is too damaged to read

D. was meant for someone else

E. contains secret information

Passage 7

Species extinction is a natural part of evolution, but current extinction rates are alarmingly high—estimated to be 100 to 1,000 times higher than the natural background rate. Scientists warn we may be entering Earth's sixth mass extinction event, the first caused primarily by human activity.

Habitat destruction is the leading cause of species loss. When forests are cleared for agriculture or development, animals lose their homes. Even species that survive initially may not have enough space to maintain healthy populations. Fragmented habitats also isolate populations, reducing genetic diversity and making species more vulnerable to disease.

Pollution takes many forms, all harmful to wildlife. Pesticides kill not just target insects but also birds and beneficial insects. Plastic waste in oceans kills marine animals through ingestion or entanglement. Air pollution and acid rain damage ecosystems worldwide. Even light pollution affects animals—birds that migrate at night can become disoriented by artificial lights.

Climate change compounds these threats. Rising temperatures force species to migrate to cooler regions, but human development often blocks their path. Coral reefs, home to 25% of marine species, are dying as oceans warm and acidify. Polar species like penguins and polar bears lose habitat as ice melts.

However, conservation efforts show promise. Protected areas give species safe havens. Breeding programs have brought animals like the California condor back from near-extinction. International agreements limit harmful practices. Individual actions matter too: reducing plastic use, supporting conservation organizations, and making sustainable choices all help protect biodiversity. Every species lost diminishes our world, but every species saved is a victory worth fighting for.

31. Current extinction rates are estimated to be how many times higher than natural rates?

A. 100 to 1,000 times

B. 10 to 50 times

C. 10,000 times

D. 2 to 5 times

E. 50 to 100 times

32. According to the passage, the leading cause of species loss is

A. pollution

B. hunting

C. disease

D. habitat destruction

E. climate change alone

33. Coral reefs are home to approximately what percentage of marine species?

A. 10%

B. 50%

C. 25%

D. 75%

E. 5%

34. Light pollution affects animals by

A. making them warmer

B. improving their vision

C. helping them hunt

D. poisoning them

E. disorienting migrating birds

35. The California condor is given as an example of

A. an extinct species

B. successful breeding programs

C. a polluted habitat

D. climate change impact

E. habitat fragmentation

Passage 8

Marie Curie was born Maria Sklodowska in Warsaw, Poland, in 1867, at a time when Poland was under Russian control and women faced severe educational restrictions. Despite these obstacles, she became one of history's most influential scientists and the first woman to win a Nobel Prize.

Unable to attend university in Poland due to gender restrictions, Maria worked as a governess to save money for her education. At age 24, she moved to Paris to study physics and mathematics at the Sorbonne. She lived in poverty, sometimes fainting from hunger as she studied, but graduated at the top of her class.

In Paris, she met physicist Pierre Curie, and they married in 1895. Together, they investigated radioactivity—a term Marie coined. Working in a converted shed with primitive equipment, they discovered two new elements: polonium (named for her homeland) and radium. Their work required processing tons of radioactive material, exposing them to dangerous radiation levels that weren't yet understood.

In 1903, Marie Curie became the first woman to win a Nobel Prize, sharing the Physics award with Pierre and another scientist. After Pierre's tragic death in 1906, Marie continued their research. In 1911, she won a second Nobel Prize, this time in Chemistry, becoming the only person ever to win Nobel Prizes in two different sciences.

Curie's work laid the foundation for modern physics and cancer treatment through radiation therapy. However, her constant exposure to radioactive materials eventually killed her—she died in 1934 from aplastic anemia caused by radiation poisoning. Even today, her research papers are too radioactive to handle safely and must be kept in lead-lined boxes. Her legacy proves that curiosity and determination can overcome any obstacle, though sometimes at great personal cost.

36. Marie Curie was born in

A. 1867

B. 1895

C. 1903

D. 1911

E. 1880

37. Curie could not attend university in Poland because

A. she was too young

B. she lacked money

C. universities didn't exist

D. of gender restrictions

E. she wasn't interested

38. Marie and Pierre Curie discovered how many new elements?

A. one

B. three

C. two

D. four

E. five

39. Marie Curie won Nobel Prizes in

A. Physics and Medicine

B. Chemistry and Biology

C. Mathematics and Physics

D. Literature and Peace

E. Physics and Chemistry

40. Marie Curie died from

A. old age

B. aplastic anemia caused by radiation poisoning

C. an accident

D. an infection

E. heart disease

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. HASTY:

A. slow

B. careful

C. thoughtful

D. rushed

E. deliberate

2. SERENE:

A. angry

B. peaceful

C. stormy

D. loud

E. chaotic

3. TRIUMPH:

A. victory

B. loss

C. defeat

D. failure

E. struggle

4. MEAGER:

A. generous

B. abundant

C. plentiful

D. ample

E. scanty

5. NIMBLE:

A. clumsy

B. awkward

C. agile

D. stiff

E. slow

6. BLEAK:

A. cheerful

B. bright

C. sunny

D. dismal

E. happy

7. MEND:

A. break

B. repair

C. destroy

D. ruin

E. damage

8. ANGUISH:

A. suffering

B. joy

C. happiness

D. pleasure

E. delight

9. TEDIOUS:

A. exciting

B. interesting

C. thrilling

D. fascinating

E. boring

10. VIVID:

A. dull

B. faint

C. bright

D. pale

E. dim

11. IMMENSE:

A. tiny

B. small

C. little

D. huge

E. miniature

12. PERILOUS:

A. safe

B. dangerous

C. secure

D. protected

E. harmless

13. OBVIOUS:

A. clear

B. hidden

C. obscure

D. secret

E. mysterious

14. ANCIENT:

A. new

B. modern

C. recent

D. current

E. old

15. SCARCE:

A. abundant

B. plentiful

C. rare

D. common

E. frequent

16. GENUINE:

A. false

B. fake

C. artificial

D. authentic

E. imitation

17. HOSTILE:

A. friendly

B. unfriendly

C. kind

D. warm

E. welcoming

18. SLENDER:

A. thin

B. thick

C. wide

D. fat

E. broad

19. FAMISHED:

A. full

B. satisfied

C. content

D. stuffed

E. starving

20. DURABLE:

A. weak

B. fragile

C. sturdy

D. breakable

E. delicate

21. PECULIAR:

A. normal

B. ordinary

C. common

D. odd

E. typical

22. BRIEF:

A. long

B. short

C. extended

D. lengthy

E. prolonged

23. VAGUE:

A. unclear

B. specific

C. precise

D. exact

E. definite

24. FURIOUS:

A. calm

B. peaceful

C. tranquil

D. serene

E. angry

25. TENDER:

A. rough

B. hard

C. gentle

D. harsh

E. tough

26. EAGER:

A. reluctant

B. unwilling

C. hesitant

D. enthusiastic

E. indifferent

27. REMEDY:

A. problem

B. cure

C. illness

D. disease

E. sickness

28. FEEBLE:

A. weak

B. strong

C. powerful

D. mighty

E. robust

29. HOSTILE:

A. friendly

B. welcoming

C. kind

D. warm

E. antagonistic

30. DROWSY:

A. alert

B. awake

C. sleepy

D. energetic

E. lively

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. Flour is to bread as

A. water is to ice

B. clay is to pottery

C. paper is to book

D. metal is to car

E. wood is to tree

32. Steering wheel is to car as

A. pedal is to bicycle

B. wing is to airplane

C. sail is to boat

D. rudder is to ship

E. engine is to train

33. Drought is to rain as

A. famine is to food

B. flood is to water

C. wind is to storm

D. cold is to ice

E. heat is to fire

34. Acorn is to oak as

A. flower is to garden

B. leaf is to tree

C. egg is to chicken

D. root is to plant

E. fruit is to orchard

35. Lens is to camera as

A. handle is to door

B. wheel is to car

C. key is to lock

D. button is to shirt

E. screen is to television

36. Grateful is to gift as

A. angry is to insult

B. proud is to achievement

C. sad is to loss

D. scared is to danger

E. happy is to celebration

37. Freezer is to ice as

A. stove is to heat

B. refrigerator is to cold

C. microwave is to food

D. oven is to warmth

E. toaster is to bread

38. Telescope is to distant as

A. microscope is to tiny

B. binoculars is to near

C. glasses is to blurry

D. camera is to still

E. mirror is to reflected

39. Chapter is to book as

A. verse is to poem

B. scene is to movie

C. stanza is to poem

D. sentence is to paragraph

E. word is to sentence

40. Paddle is to canoe as

A. sail is to boat

B. engine is to car

C. pedal is to bicycle

D. wing is to airplane

E. oar is to rowboat

41. Conductor is to train as

A. teacher is to student

B. pilot is to airplane

C. passenger is to bus

D. captain is to ship

E. driver is to car

42. Rough is to sandpaper as

A. wet is to water

B. cold is to ice

C. hot is to fire

D. smooth is to glass

E. sharp is to knife

43. Intermission is to play as

A. halftime is to game

B. pause is to music

C. break is to work

D. rest is to exercise

E. stop is to journey

44. Antler is to deer as

A. wing is to bird

B. fin is to fish

C. horn is to bull

D. tail is to dog

E. hoof is to horse

45. Drizzle is to downpour as

A. breeze is to gale

B. stream is to river

C. spark is to flame

D. whisper is to shout

E. breeze is to hurricane

46. Question is to answer as

A. lock is to key

B. problem is to solution

C. cause is to effect

D. riddle is to puzzle

E. mystery is to clue

47. Yolk is to egg as

A. skin is to fruit

B. shell is to nut

C. peel is to banana

D. pit is to cherry

E. seed is to apple

48. Shiver is to cold as

A. sweat is to heat

B. smile is to happiness

C. cry is to sadness

D. yawn is to tiredness

E. sneeze is to allergy

49. Dormant is to volcano as

A. extinct is to species

B. sleeping is to person

C. hibernating is to bear

D. resting is to athlete

E. paused is to video

50. Blueprint is to building as

A. map is to journey

B. recipe is to meal

C. script is to play

D. diagram is to machine

E. pattern is to clothing

51. Hunger is to eat as

A. thirst is to drink

B. fatigue is to sleep

C. pain is to heal

D. boredom is to entertain

E. curiosity is to learn

52. Tadpole is to amphibian as

A. egg is to reptile

B. larva is to insect

C. calf is to mammal

D. caterpillar is to insect

E. chick is to bird

53. Telescope is to astronomer as

A. stethoscope is to doctor

B. microscope is to biologist

C. calculator is to mathematician

D. compass is to navigator

E. ruler is to architect

54. Quench is to thirst as

A. heal is to wound

B. solve is to problem

C. satisfy is to hunger

D. cure is to disease

E. all of the above

55. Transparent is to window as

A. reflective is to mirror

B. absorbent is to sponge

C. flexible is to rubber

D. magnetic is to iron

E. opaque is to wall

56. Cocoon is to moth as

A. shell is to clam

B. chrysalis is to butterfly

C. nest is to bird

D. web is to spider

E. hive is to bee

57. Pen is to novelist as

A. camera is to photographer

B. brush is to painter

C. chisel is to sculptor

D. baton is to conductor

E. microphone is to singer

58. Dawn is to dusk as

A. sunrise is to sunset

B. morning is to evening

C. day is to night

D. beginning is to end

E. spring is to fall

59. Scales is to fish as

A. shell is to turtle

B. fur is to mammal

C. feathers is to bird

D. skin is to reptile

E. wings is to insect

60. Calendar is to date as

A. clock is to time

B. thermometer is to temperature

C. map is to location

D. ruler is to length

E. compass is to direction

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. What is 288 ÷ 24?

A. 11

B. 13

C. 12

D. 14

E. 10

2. If w + 51 = 127, then w =

A. 178

B. 51

C. 127

D. 66

E. 76

3. A sequence follows the rule: add 15 to the previous number. If the first number is 17, what is the 5th number?

A. 92

B. 77

C. 62

D. 47

E. 32

4. What is the area of a rectangle with length 25 and width 11?

A. 275

B. 36

C. 72

D. 250

E. 300

5. If $19x = 247$, then $x =$

A. 228

B. 266

C. 19

D. 13

E. 12

6. A choir has 108 members. If 5/9 of them are sopranos, how many are sopranos?

A. 54

B. 72

C. 60

D. 48

E. 81

7. What is $72 + 13 \times 4 - 9$?

A. 331

B. 340

C. 328

D. 124

E. 115

8. A box contains 4 red balls, 6 blue balls, and 5 green balls. What is the probability of selecting a red ball?

A. 1/4

B. 4/15

C. 2/5

D. 4/11

E. 6/15

9. Which of the following is equivalent to 0.45?

A. 9/20

B. 4/5

C. 45/10

D. 1/45

E. 45/1000

10. A circle has a radius of 23. What is its diameter?

A. 11.5

B. 69

C. 23

D. 46

E. 92

11. If $11y + 22 = 99$, then $y =$

A. 77

B. 22

C. 7

D. 11

E. 9

12. A computer originally costs $320. It's now on sale for 25% off. What is the sale price?

A. $295

B. $80

C. $160

D. $280

E. $240

13. What is $25^2 - 22^2$?

A. 3

B. 141

C. 484

D. 625

E. 9

14. If $t > 140$ and $t < 145$, which could NOT be the value of t?

A. 145

B. 141

C. 143.5

D. 142

E. 144

15. A recipe requires 12 tablespoons of sugar to make 18 cookies. How many tablespoons are needed for 27 cookies?

A. 16

B. 15

C. 20

D. 18

E. 21

16. What is 19/25 − 11/25?

A. 30/25

B. 11/25

C. 8/25

D. 19/50

E. 8/50

17. Round 13,547 to the nearest hundred.

A. 14,000

B. 13,550

C. 13,540

D. 13,400

E. 13,500

18. What is the least common multiple (LCM) of 20 and 25?

A. 5

B. 100

C. 50

D. 500

E. 25

19. If the pattern continues: 8, 24, 72, 216, ___, what is the next number?

A. 648

B. 432

C. 288

D. 540

E. 864

20. A triangle has a base of 32 and a height of 23. What is its area?

A. 55

B. 736

C. 110

D. 368

E. 460

21. What is 80% of 175?

A. 80

B. 120

C. 140

D. 160

E. 150

22. If $23 \times z = 299$, then z =

A. 12

B. 23

C. 14

D. 11

E. 13

23. A number is multiplied by 11, then 18 is subtracted. The result is 70. What is the number?

A. 7

B. 8

C. 9

D. 6

E. 10

24. The ratio of fiction books to nonfiction books in a library is 6:7. If there are 42 fiction books, how many nonfiction books are there?

A. 49

B. 36

C. 56

D. 63

E. 48

25. What is $45 + 9^2 - 16$?

A. 92

B. 94

C. 126

D. 110

E. 81

ANSWERS AND EXPLANATIONS

Quantitative

1. D: 13 - Divide 273 by 21: 273 ÷ 21 = 13. This is a division fact from the 21 times table. Check: 21 × 13 = 273 ✓ Knowing multiplication facts helps solve division problems quickly.

2. A: 55 - Solve p + 43 = 98 by subtracting 43 from both sides: p = 98 − 43 = 55. Check: 55 + 43 = 98 ✓ To undo addition, use subtraction.

3. C: 35 - The sequence subtracts 8 each time. 1st number: 75. 2nd number: 75 − 8 = 67. 3rd number: 67 − 8 = 59. 4th number: 59 − 8 = 51. 5th number: 51 − 8 = 43. 6th number: 43 − 8 = 35. This is an arithmetic sequence with common difference −8.

4. E: 184 - Area of a rectangle = length × width = 23 × 8 = 184 square units. Don't confuse with perimeter, which would be 2(23 + 8) = 62. Area measures the space inside.

5. B: 13 - Solve 17x = 221 by dividing both sides by 17: x = 221 ÷ 17 = 13. Check: 17 × 13 = 221 ✓ Division is the inverse of multiplication.

6. D: 56 - To find 7/12 of 96 members, multiply: (7/12) × 96. Divide 96 by 12 first: 96 ÷ 12 = 8. Then multiply by 7: 8 × 7 = 56 members are female.

7. A: 30 - Follow order of operations (PEMDAS). Multiply first: 9 × 5 = 45. Then work left to right: 63 − 45 = 18, then 18 + 12 = 30. Multiplication must be done before addition and subtraction.

8. C: 1/4 - Multiples of 4 between 1 and 20 are: 4, 8, 12, 16, 20 (that's 5 numbers out of 20 possible outcomes). Probability = 5/20. Simplify by dividing both by 5: 5/20 = 1/4. Count favorable outcomes over total possible outcomes.

9. E: 17/20 - Convert 0.85 to a fraction: 0.85 = 85/100. Simplify by dividing both numerator and denominator by 5: 85 ÷ 5 = 17 and 100 ÷ 5 = 20, giving 17/20. Check: 17 ÷ 20 = 0.85 ✓

10. B: 21 - The radius of a circle is half the diameter. If diameter = 42, then radius = 42 ÷ 2 = 21. Remember: diameter goes all the way across, radius goes from center to edge.

11. D: 7 - Solve 9y + 19 = 82 in two steps. Subtract 19 from both sides: 9y = 63. Divide both sides by 9: y = 7. Check: 9(7) + 19 = 63 + 19 = 82 ✓

12. A: $156 - Calculate 35% off of $240. Method 1: Find discount: 0.35 × $240 = $84, then subtract: $240 − $84 = $156. Method 2: If 35% off, you pay 65%: 0.65 × $240 = $156.

13. C: 129 - Calculate each exponent first, then subtract. $23^2 = 23 \times 23 = 529$. Then $20^2 = 20 \times 20 = 400$. Finally subtract: 529 − 400 = 129. Exponents must be calculated before subtraction.

14. E: 130 - The compound inequality $r > 125$ and $r < 130$ means r must be greater than 125 AND less than 130. This is a "could NOT" question. 130 does NOT satisfy $r < 130$ (130 is not less than 130; it's equal). All other choices fall between 125 and 130.

15. B: 15 - Set up a proportion: 9 cups/15 servings = x cups/25 servings. Cross-multiply: $9 \times 25 = 15 \times x$, so $225 = 15x$. Divide: $x = 15$ cups. Or find cups per serving: 9/15 = 3/5 cup per serving, so $25 \times (3/5) = 15$ cups.

16. D: 8/23 - When subtracting fractions with the same denominator, keep the denominator and subtract numerators: $17/23 - 9/23 = (17 - 9)/23 = 8/23$. The denominator stays 23; only subtract the numerators.

17. A: 11,480 - When rounding to the nearest ten, look at the ones digit. In 11,482, the ones digit is 2. Since $2 < 5$, round down: keep the tens digit as 8, making 11,480.

18. C: 72 - The LCM is the smallest number both numbers divide into evenly. List multiples: 18: 18, 36, 54, 72, 90... and 24: 24, 48, 72, 96... The first common multiple is 72. Verify: $72 \div 18 = 4$ ✓ and $72 \div 24 = 3$ ✓

19. E: 567 - Examine the pattern: 7 to 21 is ×3, 21 to 63 is ×3, 63 to 189 is ×3. Each number triples. This is a geometric sequence with ratio 3. Next number: $189 \times 3 = 567$.

20. B: 315 - Area of a triangle = (base × height) ÷ 2 = $(30 \times 21) \div 2 = 630 \div 2 = 315$ 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.

21. D: 120 - To find 75% of 160, multiply: $0.75 \times 160 = 120$. Mental math: 10% of 160 is 16, so 50% is 80, and 25% is 40, giving $80 + 40 = 120$.

22. A: 13 - Solve $21 \times v = 273$ by dividing both sides by 21: $v = 273 \div 21 = 13$. Check: $21 \times 13 = 273$ ✓ Think "21 times what equals 273?"

23. C: 56 - Work backwards from the result. If the result is 19 after adding 11, then before adding the value was $19 - 11 = 8$. If dividing by 7 gave 8, the original number was $8 \times 7 = 56$. Check: $56 \div 7 = 8$, then $8 + 11 = 19$ ✓

24. E: 81 - The ratio 4:9 means for every 4 pencils, there are 9 pens. If there are 36 pencils, find how many groups of 4: $36 \div 4 = 9$ groups. Each group has 9 pens, so total pens = $9 \times 9 = 81$. Or proportion: $4/9 = 36/x$, cross multiply: $4x = 324$, so $x = 81$.

25. B: 85 - Follow order of operations. Calculate the exponent first: $8^2 = 64$. Then work left to right: $35 + 64 = 99$, then $99 - 14 = 85$. Exponents are calculated before addition and subtraction.

Reading

1. A: enters Earth's atmosphere - The passage states: "When a meteoroid enters Earth's atmosphere, friction with air molecules heats it to thousands of degrees. The object begins to glow, creating a bright streak of light across the sky—what we call a meteor." Entry into the atmosphere triggers the transformation.

2. D: 50-75 miles above Earth - The passage specifies: "Most meteors burn up completely before reaching the ground, disintegrating at altitudes of 50 to 75 miles above Earth." This altitude range is clearly stated.

3. C: the early solar system - The passage explains: "Scientists study meteorites to learn about the early solar system since these rocks have remained largely unchanged for billions of years." They provide information about solar system formation.

4. E: Earth passes through comet debris trails - The passage states: "The famous meteor shower events...occur when Earth passes through debris trails left by comets." This crossing of debris paths causes the showers.

5. B: meteorite - The passage defines: "However, if a meteor survives its fiery journey through the atmosphere and lands on Earth, it becomes a meteorite." Landing on Earth's surface creates a meteorite.

6. A: a finalist for a poetry award - The opening email states: "Congratulations! You've been selected as a finalist for the National Youth Poetry Award." This specific honor is mentioned.

7. D: having to perform in front of people - The narrator's fear is clear: "I have to read my poem. Out loud. In front of everyone" and mentions stage fright. Public performance is the issue.

8. C: ran off stage - The passage recalls: "Last year, I'd literally run off stage during a class presentation, unable to speak." This past incident demonstrates the narrator's stage fright.

9. E: immigration journey - The narrator mentions: "My poem—the one about my grandmother's immigration journey." The poem's subject is explicitly stated.

10. B: the story matters more than fear - The passage concludes: "Maybe I could too. Not because I wasn't scared—but because the story was bigger than my fear." The narrator realizes the poem's importance outweighs personal fear.

11. A: leaves - The passage states: "Photosynthesis occurs primarily in plant leaves, within specialized structures called chloroplasts." Leaves are identified as the primary location.

12. D: red and blue - The passage explains: "These contain chlorophyll, the green pigment that absorbs light energy—primarily red and blue wavelengths." These specific wavelengths are absorbed.

13. C: water molecules - The passage describes: "The light-dependent reactions occur first, using sunlight to split water molecules into hydrogen and oxygen. The oxygen is released into the atmosphere as a byproduct." Water splitting produces oxygen.

14. E: light-independent reactions - The passage states: "The light-independent reactions, also called the Calvin cycle." This alternative name is provided.

15. B: nearly all food chains - The passage concludes: "When animals eat plants, they access this stored energy, making photosynthesis the foundation of nearly all food chains." This foundational role is emphasized.

16. A: 1955 - The opening sentence states: "On December 1, 1955, Rosa Parks boarded a bus in Montgomery, Alabama." The year is clearly specified.

17. D: a trained civil rights activist - The passage explains: "She was a trained civil rights activist and secretary of the local NAACP chapter. She had attended workshops on nonviolent resistance." Her training and preparation are documented.

18. C: 381 days - The passage states: "For 381 days, African Americans in Montgomery refused to ride city buses." This specific duration is mentioned.

19. E: Martin Luther King Jr. - The passage notes: "Parks' arrest triggered the Montgomery Bus Boycott, organized by a young minister named Martin Luther King Jr." King's role is specified.

20. B: lost her job - The passage explains: "Parks paid a heavy price for her courage. She received death threats, lost her job, and eventually had to leave Alabama." Job loss was one consequence.

21. A: a medium (solid, liquid, or gas) - The passage states: "Unlike light, which can travel through empty space, sound requires a medium—solid, liquid, or gas—to propagate." A medium is necessary for sound.

22. D: 767 mph - The passage specifies: "In air at room temperature, sound travels at approximately 767 miles per hour (343 meters per second)." This speed is clearly stated.

23. C: solids - The passage explains: "However, sound travels faster through water—about four times as fast—and even faster through solids like steel." Solids allow fastest sound transmission.

24. E: logarithmic - The passage states: "The decibel scale is logarithmic, meaning each increase of 10 dB represents a tenfold increase in intensity." This scale type is explicitly mentioned.

25. B: 85 dB - The passage warns: "Prolonged exposure to sounds above 85 dB can damage hearing permanently." This threshold level is specified.

26. A: a military medal - The opening sentence states: "I found the letter tucked inside my great-grandfather's military medal—a Purple Heart from World War II." The medal was the hiding place.

27. D: 1944 - The passage notes the letter was "dated August 1944, just weeks before he was wounded in France." The year is specified.

28. C: France - The passage mentions the letter was written "just weeks before he was wounded in France." France is the location of his wounding.

29. E: all the letters were lost - Grandma responds: "I knew he wrote to my mother, but I thought all the letters were lost." She believed they no longer existed.

30. B: allows the great-grandfather to speak again - The passage concludes: "And in a yellowed letter written eight decades ago, a man spoke to his family again—reminding us that love outlasts even the longest silence." The letter gives voice to the deceased.

31. A: 100 to 1,000 times - The opening paragraph states: "current extinction rates are alarmingly high—estimated to be 100 to 1,000 times higher than the natural background rate." This range is specified.

32. D: habitat destruction - The passage states: "Habitat destruction is the leading cause of species loss." This is identified as the primary threat.

33. C: 25% - The passage notes: "Coral reefs, home to 25% of marine species, are dying as oceans warm and acidify." This percentage is clearly stated.

34. E: disorienting migrating birds - The passage explains: "Even light pollution affects animals—birds that migrate at night can become disoriented by artificial lights." Disorientation is the specific effect.

35. B: successful breeding programs - The passage states: "Breeding programs have brought animals like the California condor back from near-extinction." The condor exemplifies conservation success.

36. A: 1867 - The opening sentence states: "Marie Curie was born Maria Sklodowska in Warsaw, Poland, in 1867." Her birth year is specified.

37. D: of gender restrictions - The passage explains: "Unable to attend university in Poland due to gender restrictions." Gender discrimination prevented her Polish university education.

38. C: two - The passage states: "Working in a converted shed with primitive equipment, they discovered two new elements: polonium (named for her homeland) and radium." Two elements are mentioned.

39. E: Physics and Chemistry - The passage notes: "In 1903, Marie Curie became the first woman to win a Nobel Prize...the Physics award" and "In 1911, she won a second Nobel Prize, this time in Chemistry." Both fields are specified.

40. B: aplastic anemia caused by radiation poisoning - The passage states: "she died in 1934 from aplastic anemia caused by radiation poisoning." This specific cause of death is given.

Verbal

1. D: rushed - Hasty and rushed both mean done with excessive speed, hurried. "A hasty decision" and "a rushed decision" describe choices made too quickly. Both indicate lack of careful consideration.

2. B: peaceful - Serene and peaceful both mean calm, tranquil, undisturbed. "A serene landscape" and "a peaceful landscape" describe the same quiet beauty. Both indicate calmness and harmony.

3. A: victory - Triumph and victory both mean a great success or win, especially after difficulty. "A triumph over adversity" and "a victory over adversity" describe the same achievement. Both indicate successful outcomes.

4. E: scanty - Meager and scanty both mean lacking in quantity or quality, insufficient. "Meager supplies" and "scanty supplies" describe inadequate resources. Both indicate deficiency or inadequacy.

5. C: agile - Nimble and agile both mean quick and light in movement, able to move easily. "Nimble fingers" and "agile fingers" describe the same dexterity. Both indicate quickness and flexibility.

6. D: dismal - Bleak and dismal both mean depressing and dreary, offering no hope. "A bleak outlook" and "a dismal outlook" describe the same pessimistic view. Both indicate darkness or hopelessness.

7. B: repair - Mend and repair both mean to fix something that is broken or damaged, to restore. "Mend a fence" and "repair a fence" mean the same. Both indicate restoration or fixing.

8. A: suffering - Anguish and suffering both mean severe mental or physical pain or distress. "In anguish" and "in suffering" describe the same state of pain. Both indicate intense distress.

9. E: boring - Tedious and boring both mean tiresome and dull, causing weariness. "A tedious task" and "a boring task" describe something uninteresting. Both indicate lack of interest or excitement.

10. C: bright - Vivid and bright both mean producing powerful, clear images or colors. "Vivid colors" and "bright colors" describe the same intensity. Both indicate strong, clear appearance.

11. D: huge - Immense and huge both mean extremely large in size or degree. "An immense building" and "a huge building" describe the same massive structure. Both emphasize great size.

12. B: dangerous - Perilous and dangerous both mean full of danger or risk, hazardous. "A perilous journey" and "a dangerous journey" describe the same risky trip. Both indicate threat or hazard.

13. A: clear - Obvious and clear both mean easily seen, recognized, or understood. "An obvious answer" and "a clear answer" describe something easily understood. Both indicate lack of ambiguity.

14. E: old - Ancient and old both mean belonging to the very distant past, aged. "Ancient ruins" and "old ruins" describe structures from long ago, though ancient typically implies greater age. Both indicate age.

15. C: rare - Scarce and rare both mean insufficient to meet demand, not common. "Scarce resources" and "rare resources" describe limited availability. Both indicate limited supply.

16. D: authentic - Genuine and authentic both mean truly what something is said to be, real. "A genuine artifact" and "an authentic artifact" describe the same real object. Both indicate truthfulness or reality.

17. B: unfriendly - Hostile and unfriendly both mean showing opposition or dislike, antagonistic. "A hostile attitude" and "an unfriendly attitude" describe the same unwelcoming behavior. Both indicate opposition or coldness.

18. A: thin - Slender and thin both mean small in width relative to length, not thick. "A slender branch" and "a thin branch" describe the same narrow limb. Both indicate narrowness.

19. E: starving - Famished and starving both mean extremely hungry. "Feeling famished" and "feeling starving" describe the same intense hunger. Both emphasize extreme hunger.

20. C: sturdy - Durable and sturdy both mean able to withstand wear, pressure, or damage. "Durable materials" and "sturdy materials" describe the same strong substances. Both indicate strength and longevity.

21. D: odd - Peculiar and odd both mean strange or unusual, different from normal. "Peculiar behavior" and "odd behavior" describe the same strange actions. Both indicate strangeness or unusualness.

22. B: short - Brief and short both mean lasting or taking a small amount of time. "A brief visit" and "a short visit" describe the same quick stop. Both indicate limited duration.

23. A: unclear - Vague and unclear both mean not clearly expressed or understood, imprecise. "Vague instructions" and "unclear instructions" describe the same confusing directions. Both indicate lack of clarity.

24. E: angry - Furious and angry both mean extremely mad or enraged. "Furious about the delay" and "angry about the delay" describe intense displeasure, though furious is more intense. Both indicate anger.

25. C: gentle - Tender and gentle both mean showing care and kindness, soft. "A tender touch" and "a gentle touch" describe the same careful handling. Both indicate softness and care.

26. D: enthusiastic - Eager and enthusiastic both mean having or showing keen interest or excitement. "Eager to learn" and "enthusiastic to learn" describe the same excitement. Both indicate strong interest.

27. B: cure - Remedy and cure both mean something that corrects or relieves a problem, especially illness. "A remedy for headaches" and "a cure for headaches" both address the problem. Both indicate solutions.

28. A: weak - Feeble and weak both mean lacking physical strength or vitality. "Feeble with age" and "weak with age" describe the same lack of strength. Both indicate lack of power.

29. E: antagonistic - Hostile and antagonistic both mean showing opposition or hostility, unfriendly. "Hostile forces" and "antagonistic forces" describe opposing sides. Both indicate opposition.

30. C: sleepy - Drowsy and sleepy both mean feeling inclined to sleep, sluggish. "Feeling drowsy" and "feeling sleepy" describe the same tired state. Both indicate tiredness.

31. B: clay is to pottery - **Relationship: Raw material to finished product.** Flour is the raw material used to make bread, just as clay is the raw material used to make pottery. Both show materials transformed through a process into final products.

32. D: rudder is to ship - **Relationship: Steering mechanism to vehicle.** A steering wheel controls the direction of a car, just as a rudder controls the direction of a ship. Both show devices that steer their respective vehicles.

33. A: famine is to food - **Relationship: Crisis defined by shortage to what is lacking.** A drought is a severe shortage of rain, just as a famine is a severe shortage of food. Both show crisis conditions defined by scarcity.

34. C: egg is to chicken - **Relationship: Reproductive unit to what develops from it.** An acorn grows into an oak tree, just as an egg develops into a chicken. Both show starting forms and what grows from them.

35. E: screen is to television - **Relationship: Display component to device.** A lens is the viewing component of a camera, just as a screen is the viewing component of a television. Both show the parts through which we see/view.

36. B: proud is to achievement - **Relationship: Emotion to what causes it.** Feeling grateful is triggered by receiving a gift, just as feeling proud is triggered by an achievement. Both show emotions paired with their typical causes.

37. D: oven is to warmth - **Relationship: Appliance to temperature condition it produces.** A freezer produces ice (extreme cold), just as an oven produces warmth (heat). Both show appliances and the temperature conditions they create.

38. A: microscope is to tiny - **Relationship: Viewing instrument to size characteristic of what it views.** A telescope is used to view distant objects, just as a microscope is used to view tiny objects. Both show instruments paired with size characteristics.

39. C: stanza is to poem - **Relationship: Subdivision to literary work.** A chapter is a section of a book, just as a stanza is a section of a poem. Both show structural divisions within written works.

40. E: oar is to rowboat - **Relationship: Manual propulsion tool to watercraft.** A paddle propels a canoe, just as an oar propels a rowboat. Both show hand-powered propulsion methods for boats.

41. B: pilot is to airplane - **Relationship: Operator to vehicle.** A conductor operates a train, just as a pilot operates an airplane. Both show professionals who control transportation vehicles.

42. D: smooth is to glass - Relationship: Texture characteristic to material possessing it. Rough describes the texture of sandpaper, just as smooth describes the texture of glass. Both show materials paired with their typical surface textures.

43. A: halftime is to game - Relationship: Break period to performance event. An intermission is a break during a play, just as halftime is a break during a game. Both show pauses that divide events.

44. C: horn is to bull - Relationship: Bony protrusion to animal possessing it. An antler is a bony growth on a deer, just as a horn is a bony growth on a bull. Both show animals paired with their characteristic head protrusions.

45. E: breeze is to hurricane - Relationship: Mild version to extreme version. A drizzle is light rain compared to a downpour's heavy rain, just as a breeze is light wind compared to a hurricane's extreme wind. Both show intensity progression.

46. B: problem is to solution - Relationship: Challenge to its resolution. A question seeks an answer, just as a problem seeks a solution. Both show issues paired with their resolutions.

47. D: pit is to cherry - Relationship: Inner core to fruit containing it. A yolk is the center of an egg, just as a pit is the center/seed of a cherry. Both show internal cores within their containers.

48. A: sweat is to heat - Relationship: Body's response to environmental condition. Shivering is the body's response to cold, just as sweating is the body's response to heat. Both show involuntary physical reactions to temperature.

49. C: hibernating is to bear - Relationship: Inactive state to living thing in that state. A dormant volcano is inactive but could become active, just as a hibernating bear is sleeping but will wake. Both show temporary inactive states.

50. E: pattern is to clothing - Relationship: Design plan to finished product. A blueprint is the design plan for a building, just as a pattern is the design plan for clothing. Both show templates that guide construction.

51. B: fatigue is to sleep - Relationship: Physical need to action that addresses it. Hunger prompts you to eat, just as fatigue prompts you to sleep. Both show bodily needs and their natural responses.

52. D: caterpillar is to insect - Relationship: Larval stage to adult class. A tadpole is the larval stage of an amphibian, just as a caterpillar is the larval stage of an insect (specifically moths/butterflies). Both show immature forms and their adult classifications.

53. A: stethoscope is to doctor - Relationship: Professional instrument to practitioner. A telescope is an astronomer's primary tool, just as a stethoscope is a doctor's primary tool. Both show professionals paired with their characteristic instruments.

54. E: all of the above - Relationship: Action that resolves to condition resolved. All options correctly show actions that resolve their paired conditions (quench-thirst, heal-wound, solve-problem, satisfy-hunger, cure-disease). Multiple correct answers exist.

55. E: opaque is to wall - Relationship: Light transmission property to object possessing it. Transparent describes a window's property of allowing light through, just as opaque describes a wall's property of blocking light. Both show objects and their light-related properties.

56. B: chrysalis is to butterfly - Relationship: Protective casing during metamorphosis to what emerges. A cocoon protects a developing moth, just as a chrysalis protects a developing butterfly. Both show pupal casings and what emerges from them.

57. D: baton is to conductor - Relationship: Primary tool to artist. A pen is a novelist's primary tool, just as a baton is a conductor's primary tool. Both show creative professionals with their characteristic instruments.

58. A: sunrise is to sunset - Relationship: Beginning celestial event to ending celestial event of day. Dawn (sunrise) marks the day's beginning, just as dusk (sunset) marks its end. Both show daily transition times.

59. C: feathers is to bird - Relationship: Outer covering to animal possessing it. Scales cover a fish's body, just as feathers cover a bird's body. Both show animals and their characteristic body coverings.

60. E: compass is to direction - Relationship: Instrument to what it indicates. A calendar shows dates, just as a compass shows direction. Both show tools that provide specific types of information.

Quantitative

1. C: 12 - Divide 288 by 24: $288 \div 24 = 12$. This is a division fact from the 24 times table. Check: $24 \times 12 = 288$ ✓ Knowing multiplication facts helps solve division problems quickly.

2. E: 76 - Solve $w + 51 = 127$ by subtracting 51 from both sides: $w = 127 - 51 = 76$. Check: $76 + 51 = 127$ ✓ To undo addition, use subtraction.

3. B: 77 - The sequence adds 15 each time. 1st number: 17. 2nd number: $17 + 15 = 32$. 3rd number: $32 + 15 = 47$. 4th number: $47 + 15 = 62$. 5th number: $62 + 15 = 77$. This is an arithmetic sequence with common difference 15.

4. A: 275 - Area of a rectangle = length × width = $25 \times 11 = 275$ square units. Don't confuse with perimeter, which would be $2(25 + 11) = 72$. Area measures the space inside.

5. D: 13 - Solve $19x = 247$ by dividing both sides by 19: $x = 247 \div 19 = 13$. Check: $19 \times 13 = 247$ ✓ Division is the inverse of multiplication.

6. C: 60 - To find 5/9 of 108 members, multiply: (5/9) × 108. Divide 108 by 9 first: 108 ÷ 9 = 12. Then multiply by 5: 12 × 5 = 60 sopranos.

7. E: 115 - Follow order of operations (PEMDAS). Multiply first: 13 × 4 = 52. Then work left to right: 72 + 52 = 124, then 124 − 9 = 115. Multiplication must be done before addition and subtraction.

8. B: 4/15 - Total balls: 4 red + 6 blue + 5 green = 15 balls. Probability of red = red balls/total balls = 4/15. This fraction is already in simplest form. Count favorable outcomes over total possible outcomes.

9. A: 9/20 - Convert 0.45 to a fraction: 0.45 = 45/100. Simplify by dividing both numerator and denominator by 5: 45 ÷ 5 = 9 and 100 ÷ 5 = 20, giving 9/20. Check: 9 ÷ 20 = 0.45 ✓

10. D: 46 - The diameter of a circle is twice the radius. If radius = 23, then diameter = 2 × 23 = 46. Remember: diameter goes all the way across through the center, radius goes from center to edge.

11. C: 7 - Solve 11y + 22 = 99 in two steps. Subtract 22 from both sides: 11y = 77. Divide both sides by 11: y = 7. Check: 11(7) + 22 = 77 + 22 = 99 ✓

12. E: $240 - Calculate 25% off of $320. Method 1: Find discount: 0.25 × $320 = $80, then subtract: $320 − $80 = $240. Method 2: If 25% off, you pay 75%: 0.75 × $320 = $240.

13. B: 141 - Calculate each exponent first, then subtract. $25^2 = 25 \times 25 = 625$. Then $22^2 = 22 \times 22 = 484$. Finally subtract: 625 − 484 = 141. Exponents must be calculated before subtraction.

14. A: 145 - The compound inequality $t > 140$ and $t < 145$ means t must be greater than 140 AND less than 145. This is a "could NOT" question. 145 does NOT satisfy $t < 145$ (145 is not less than 145; it's equal). All other choices fall between 140 and 145.

15. D: 18 - Set up a proportion: 12 tbsp/18 cookies = x tbsp/27 cookies. Cross-multiply: 12 × 27 = 18 × x, so 324 = 18x. Divide: x = 18 tablespoons. Or find tbsp per cookie: 12/18 = 2/3 tbsp per cookie, so 27 × (2/3) = 18 tbsp.

16. C: 8/25 - When subtracting fractions with the same denominator, keep the denominator and subtract numerators: 19/25 − 11/25 = (19 − 11)/25 = 8/25. The denominator stays 25; only subtract the numerators.

17. E: 13,500 - When rounding to the nearest hundred, look at the tens digit. In 13,547, the tens digit is 4. Since 4 < 5, round down: keep the hundreds digit as 5, making 13,500.

18. B: 100 - The LCM is the smallest number both numbers divide into evenly. List multiples: 20: 20, 40, 60, 80, 100... and 25: 25, 50, 75, 100, 125... The first common multiple is 100. Verify: 100 ÷ 20 = 5 ✓ and 100 ÷ 25 = 4 ✓

19. A: 648 - Examine the pattern: 8 to 24 is ×3, 24 to 72 is ×3, 72 to 216 is ×3. Each number triples. This is a geometric sequence with ratio 3. Next number: 216 × 3 = 648.

20. D: 368 - Area of a triangle = (base × height) ÷ 2 = (32 × 23) ÷ 2 = 736 ÷ 2 = 368 square units. You can also use formula A = ½bh. A triangle's area is always half that of a rectangle with the same base and height.

21. C: 140 - To find 80% of 175, multiply: 0.80 × 175 = 140. Mental math: 10% of 175 is 17.5, so 80% is 8 times that: 8 × 17.5 = 140.

22. E: 13 - Solve 23 × z = 299 by dividing both sides by 23: z = 299 ÷ 23 = 13. Check: 23 × 13 = 299 ✓ Think "23 times what equals 299?"

23. B: 8 - Work backwards or set up an equation. Let n be the number: (n × 11) − 18 = 70. So 11n − 18 = 70. Add 18: 11n = 88. Divide by 11: n = 8. Check: 8 × 11 = 88, then 88 − 18 = 70 ✓

24. A: 49 - The ratio 6:7 means for every 6 fiction books, there are 7 nonfiction books. If there are 42 fiction books, find how many groups of 6: 42 ÷ 6 = 7 groups. Each group has 7 nonfiction books, so total nonfiction = 7 × 7 = 49. Or proportion: 6/7 = 42/x, cross multiply: 6x = 294, so x = 49.

25. D: 110 - Follow order of operations. Calculate the exponent first: $9^2 = 81$. Then work left to right: 45 + 81 = 126, then 126 − 16 = 110. Exponents are calculated before addition and subtraction.