TEST NINJAS

PRACTICE ASSESSMENT

STUDENT TEST BOOK

Test Ninjas SSAT® Upper Level Practice Test 1

Upper Level · Grades 8–11 · Full-length practice test with answer sheet, answer key and scoring worksheet

150	6	170
SCORED QUESTIONS	SECTIONS	MINUTES

STUDENT NAME _____ DATE _____ INSTRUCTOR _____

BEFORE YOU BEGIN

- Read the directions at the start of each section.
- Work only in the section you're timed on; don't go back or ahead.
- Mark one answer per question on the answer sheet (page 5).
- Wrong answers cost ¼ point; skip a question if you can't rule out any choice.
- Don't look at the answer key until you've finished.

TEST INFORMATION

TIMING
170 minutes, 6 sections

MATERIALS
Pencils · eraser · no calculator

SCORING
Practice only · unofficial

STOP **Do not open this test book until instructed.**

STUDENT ACKNOWLEDGMENT

I understand that this practice test is unofficial and that any resulting score is an estimate. STUDENT INITIALS _____

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How this test works

This test book follows the Upper Level SSAT: the same sections, question counts and time limits, in the same order. Time each section separately, and take it in one sitting if you can.

#	SECTION	LENGTH	TIME
1	Writing Sample	Choose 1 of 2 prompts	25 minutes
2	Quantitative 1	25 questions	30 minutes
3	Reading	40 questions	40 minutes
4	Verbal	60 questions	30 minutes
5	Quantitative 2	25 questions	30 minutes
6	Experimental (unscored)	16 questions	15 minutes

Scoring

Each correct answer earns 1 point, each wrong answer loses ¼ point, and a skipped question earns 0. That raw score is converted to a scaled score for Verbal, Quantitative (both sections together) and Reading. The writing sample and the experimental section are not scored. Score yourself with the answer key and scoring worksheet at the back of this book.

Before the questions

- Set a timer for each section.
- Do scratch work in this test book.
- Use a No. 2 pencil and mark the answer sheet.
- Stop when time is called, even mid-section.

NO TEST MATERIAL ON THIS PAGE

THE TEST BEGINS ON THE NEXT PAGE

SSAT UPPER LEVEL · PRACTICE TEST 1

Answer Sheet

Fill in one circle per question. Erase changes completely.

SECTION 2 · QUANTITATIVE 1

1	A B C D E	10	A B C D E	19	A B C D E
2	A B C D E	11	A B C D E	20	A B C D E
3	A B C D E	12	A B C D E	21	A B C D E
4	A B C D E	13	A B C D E	22	A B C D E
5	A B C D E	14	A B C D E	23	A B C D E
6	A B C D E	15	A B C D E	24	A B C D E
7	A B C D E	16	A B C D E	25	A B C D E
8	A B C D E	17	A B C D E		
9	A B C D E	18	A B C D E		

SECTION 3 · READING

1	A B C D E	15	A B C D E	29	A B C D E
2	A B C D E	16	A B C D E	30	A B C D E
3	A B C D E	17	A B C D E	31	A B C D E
4	A B C D E	18	A B C D E	32	A B C D E
5	A B C D E	19	A B C D E	33	A B C D E
6	A B C D E	20	A B C D E	34	A B C D E
7	A B C D E	21	A B C D E	35	A B C D E
8	A B C D E	22	A B C D E	36	A B C D E
9	A B C D E	23	A B C D E	37	A B C D E
10	A B C D E	24	A B C D E	38	A B C D E
11	A B C D E	25	A B C D E	39	A B C D E
12	A B C D E	26	A B C D E	40	A B C D E
13	A B C D E	27	A B C D E		
14	A B C D E	28	A B C D E		

SECTION 4 · VERBAL

1	A B C D E	16	A B C D E	31	A B C D E	46	A B C D E
2	A B C D E	17	A B C D E	32	A B C D E	47	A B C D E
3	A B C D E	18	A B C D E	33	A B C D E	48	A B C D E
4	A B C D E	19	A B C D E	34	A B C D E	49	A B C D E
5	A B C D E	20	A B C D E	35	A B C D E	50	A B C D E
6	A B C D E	21	A B C D E	36	A B C D E	51	A B C D E
7	A B C D E	22	A B C D E	37	A B C D E	52	A B C D E
8	A B C D E	23	A B C D E	38	A B C D E	53	A B C D E
9	A B C D E	24	A B C D E	39	A B C D E	54	A B C D E
10	A B C D E	25	A B C D E	40	A B C D E	55	A B C D E
11	A B C D E	26	A B C D E	41	A B C D E	56	A B C D E
12	A B C D E	27	A B C D E	42	A B C D E	57	A B C D E
13	A B C D E	28	A B C D E	43	A B C D E	58	A B C D E
14	A B C D E	29	A B C D E	44	A B C D E	59	A B C D E
15	A B C D E	30	A B C D E	45	A B C D E	60	A B C D E

SECTION 5 · QUANTITATIVE 2

1	A B C D E	10	A B C D E	19	A B C D E
2	A B C D E	11	A B C D E	20	A B C D E
3	A B C D E	12	A B C D E	21	A B C D E
4	A B C D E	13	A B C D E	22	A B C D E
5	A B C D E	14	A B C D E	23	A B C D E
6	A B C D E	15	A B C D E	24	A B C D E
7	A B C D E	16	A B C D E	25	A B C D E
8	A B C D E	17	A B C D E		
9	A B C D E	18	A B C D E		

SECTION 6 · EXPERIMENTAL (UNSCORED)

1	A B C D E	7	A B C D E	13	A B C D E
2	A B C D E	8	A B C D E	14	A B C D E
3	A B C D E	9	A B C D E	15	A B C D E
4	A B C D E	10	A B C D E	16	A B C D E
5	A B C D E	11	A B C D E		
6	A B C D E	12	A B C D E		

1

SECTION 1

Writing Sample

25 minutes · unscored

DIRECTIONS

You have 25 minutes to plan and write a response to **one** of the two topics below. **Choose ONE topic and circle its letter.** A response to any other topic is not acceptable.

Write your response in ink on the lined pages provided. You may use the space below the topics to make notes or plan before you begin writing. Notes made there are not part of your response.

You are limited to **two pages**. Write only inside the lines and on both sides of the paper.

TOPIC A

Some say that the ability to admit uncertainty is a strength in a leader, and others that people follow those who sound certain. Which view do you find more convincing, and why?

TOPIC B

Write about a time you laughed so hard it was difficult to stop. What was so funny?

NOTES AND PLANNING (NOT PART OF YOUR RESPONSE)

WRITING SAMPLE · PAGE 1 OF 2 · CIRCLE THE LETTER OF YOUR TOPIC: A B

2

SECTION 2

Quantitative 1

25 questions · 30 minutes

DIRECTIONS

Each question has five answer choices. Choose the best answer and fill in its circle on your answer sheet. Work the problems in your test book; scratch paper and calculators are not allowed. Figures are drawn as accurately as possible unless a note says otherwise.

1 ALGEBRA — MULTIPLE CHOICE

A machine fills 12 bottles every 2 minutes. At this rate, how many bottles will the machine fill in 10 minutes?

A) 5

B) 12

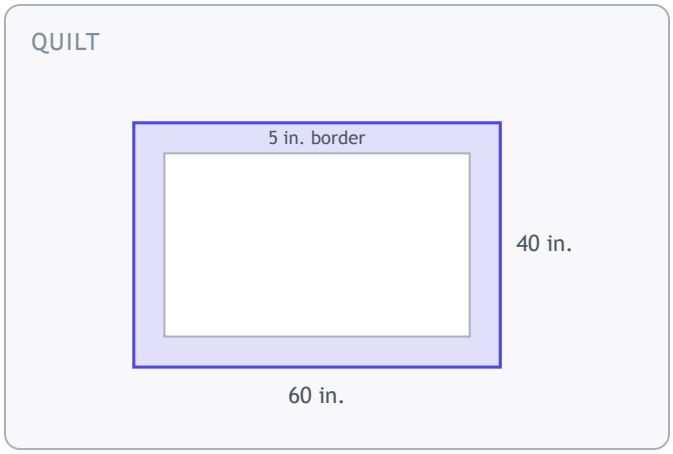
C) 24

D) 60

E) 120

2 GEOMETRY AND MEASUREMENT — MULTIPLE CHOICE

The quilt shown below is a rectangle 60 inches long and 40 inches wide. Around the inside of its edge runs a border of patches 5 inches wide, and the rest of the quilt is a single plain rectangle.



What is the area of the border, in square inches?

A) 50

B) 100

C) 200

D) 475

E) 900

3 NUMBER SENSE AND OPERATIONS — MULTIPLE CHOICE

An hour before closing, a farm stand still holds 296 crates and is asking $21.40 for each one. Rounding each of those two figures to one significant digit and then multiplying, what value does the seller reach?

A) 600

B) 1,200

C) 4,000

D) 5,920

E) 6,000

4 NUMBER SENSE AND OPERATIONS — MULTIPLE CHOICE

A honey producer's drum is marked into 8 equal parts. Five of the parts have been drawn off into squeeze bottles. What percent of the drum has been drawn off?

A) 6.25%

B) 62.5%

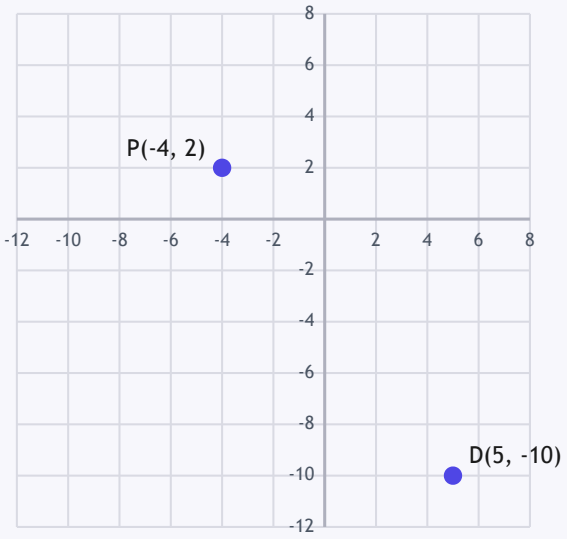
C) 160%

D) 625%

E) 652%

5 GEOMETRY AND MEASUREMENT — MULTIPLE CHOICE

A shelter's floor plan places the pantry at (-4, 2) and the loading door at (5, -10), with each unit standing for one meter. The grid below shows the two locations.

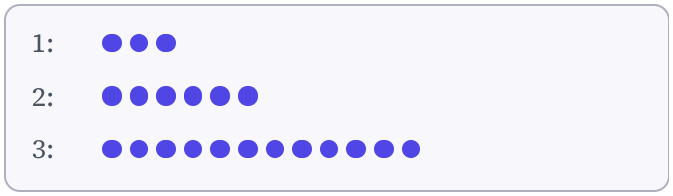


How many meters apart are the pantry and the loading door?

A) -225
B) 12
C) 15
D) 21
E) 225

6 ALGEBRA — MULTIPLE CHOICE

A debate team assigns speaking turns in rounds. The pattern below shows the first three rounds, one row for each round and one star for each member who speaks in it, and each round after that has twice as many speakers as the round before it. How many members speak in the 6th round?



A) 18
B) 32
C) 48
D) 81
E) 96

7 NUMBER SENSE AND OPERATIONS — MULTIPLE CHOICE

What is the greatest common factor of 24 and 36?

A) 6
B) 7.20
C) 12
D) 24
E) 72

8 DATA ANALYSIS AND PROBABILITY — MULTIPLE CHOICE

A fact-checking team scores an article on three tests, weighted 5, 3 and 2. One article scored 60 on the first test, 90 on the second and 90 on the third. What is its weighted average score?

A) 75
B) 80
C) 84
D) 90
E) 180

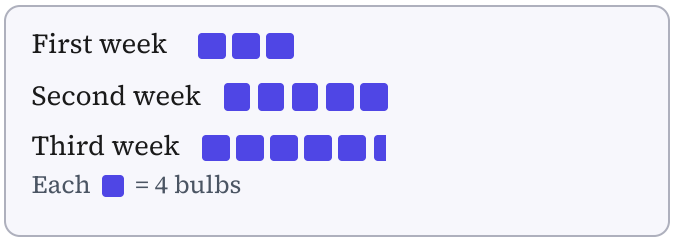
9 ALGEBRA — MULTIPLE CHOICE

A reviewer's queue of applications is ordered by the time each was submitted. One application is 9th from the earliest and 14th from the latest. How many applications are in the queue?

A) 5
B) 6
C) 10
D) 21
E) 22

10 DATA ANALYSIS AND PROBABILITY — MULTIPLE CHOICE

The pictograph below records how many bulbs were lit on a circuit each week. Each ● stands for 4 bulbs, and the + at the end of a row stands for half of one ●.



How many bulbs were lit in the third week?

A) 6
B) 12
C) 20
D) 22
E) 24

11 GEOMETRY AND MEASUREMENT — MULTIPLE CHOICE

A kayak's heading, the push of the current, and the straight line to the landing form the triangle shown below, in which XY measures 13 meters and YZ measures 20 meters.

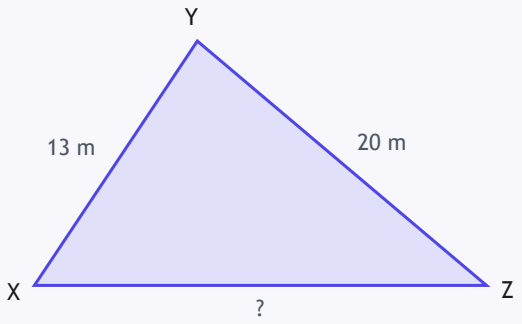


Figure not drawn to scale.

Which of the following could be the length, in meters, of XZ?

A) 6
B) 7
C) 12
D) 25
E) 33

12 ALGEBRA — MULTIPLE CHOICE

If $4n + 6 = 38$, what is the value of n?

A) 8
B) 11
C) 23
D) 28
E) 32

13 NUMBER SENSE AND OPERATIONS — MULTIPLE CHOICE

A concert program of 240 pages is printed in signatures of 16 pages and divided among three sections in the ratio 3 : 4 : 9. How many pages does the shortest section take?

A) 45

B) 60

C) 80

D) 135

E) 153

14 GEOMETRY AND MEASUREMENT — MULTIPLE CHOICE

A small window frame is a rectangle 3 feet long and 2 feet wide. A larger frame has the same shape, and its shorter side is 6 feet. What total length of timber, in feet, is needed for the four sides of the larger frame?

A) 6

B) 22

C) 26

D) 30

E) 60

15 DATA ANALYSIS AND PROBABILITY — MULTIPLE CHOICE

A course sequence runs at three levels, and each level is a prerequisite for the next. A student takes 1 of 6 introductory courses, 1 of 5 intermediate courses and 1 of 4 advanced courses. One particular advanced course is closed to any student who has taken one particular introductory course. In how many ways can a student choose the three courses?

A) 52.50

B) 105

C) 115

D) 120

E) 125

16 ALGEBRA — MULTIPLE CHOICE

A sensor network reports from nodes placed on a grid, and each node's diagnostic value is $3x^2 + y^3$, where x and y are its coordinates. What is the diagnostic value at the node (-4, -2) ?

A) 40

B) 56

C) 125

D) 136

E) 152

17 NUMBER SENSE AND OPERATIONS — MULTIPLE CHOICE

A patio is covered with 300 square tiles. Each tile measures 25 centimeters on a side, and the patio has 4 straight edges. If 20% of the tiles are gray, how many of the tiles are gray?

A) 20

B) 24

C) 25

D) 60

E) 240

18 ALGEBRA — MULTIPLE CHOICE

A dance company tours on a fixed cycle of cities, and the number of performances booked in each successive city forms the geometric sequence 2, 6, 18, … . How many performances are booked in the fifth city?

A) 48.60

B) 54

C) 162

D) 243

E) 486

19 GEOMETRY AND MEASUREMENT — MULTIPLE CHOICE

A cross-country course is laid out as triangle PQR, and a shortcut path joins the midpoints of sides PQ and PR. The figure below gives the course.

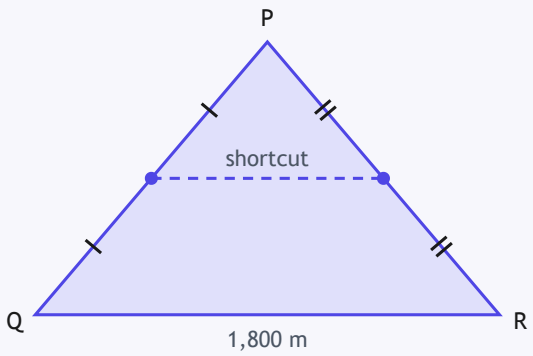


Figure not drawn to scale.

The shortcut joins the midpoint of PQ to the midpoint of PR.

How many meters long is the shortcut?

A) 900
B) 1,800
C) 2,700
D) 3,600
E) 7200

20 ALGEBRA — MULTIPLE CHOICE

A print shop prints posters in two sizes. A customer orders 4 large posters at $8 each and 4 small posters at $5 each, and the shop then takes $12 off the whole order, so the cost in dollars is $4 \times (8 + 5) - 12$ What is the cost of the order, in dollars?

A) 4
B) 25
C) 40
D) 50
E) 52

21 GEOMETRY AND MEASUREMENT — MULTIPLE CHOICE

The name badges for an orientation session are trapezoids. Each badge has parallel edges of 4 centimeters and 16 centimeters and an area of 80 square centimeters, as the figure below shows.

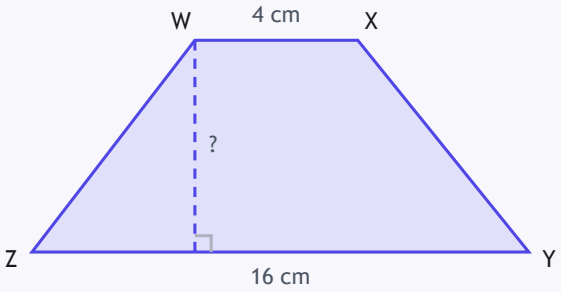


Figure not drawn to scale.

The area of badge WXYZ is 80 square centimeters.

What is the distance, in centimeters, between the two parallel edges?

A) 4
B) 8
C) 10
D) 20
E) 40

22 GEOMETRY AND MEASUREMENT — MULTIPLE CHOICE

A fee schedule is typeset with two parallel rules that a slanted stroke cuts across. At the two crossings, a pair of corresponding angles measure $(4x - 6)°$ and $(2x + 30)°$. What is the value of x ?

A) 3.60
B) 18
C) 24
D) 26
E) 36

23 ALGEBRA — MULTIPLE CHOICE

A tutoring program has 9 mentors, and no mentor may take more than 4 students. Before the term begins, each mentor meets each of the other mentors exactly once for a planning session. How many planning sessions take place?

A) 8

B) 36

C) 45

D) 72

E) 144

24 NUMBER SENSE AND OPERATIONS — MULTIPLE CHOICE

A video file is first compressed so that it loses 40 percent of its size, and the compressed file is then compressed again so that it loses 25 percent of what was left. The final file is what percent of the original file?

A) 1%

B) 10%

C) 15%

D) 35%

E) 45%

25 ALGEBRA — MULTIPLE CHOICE

A rideshare fare is quoted as a base charge plus a charge per mile, and two quotes satisfy the system $y = x + 4$ and $2x + 3y = 27$. What is the value of x?

A) 0.78

B) 3

C) 4.6

D) 7

E) 7.8

STOP If you finish before time is called, check your work in this section only. Don't turn to another section.

3

SECTION 3

Reading

40 questions · 40 minutes

DIRECTIONS

Read each passage, then answer the questions about it. Answer on the basis of what the passage states or implies. Line numbers in the margin help you find the lines a question mentions.

PASSAGE 1 · QUESTIONS 1–5

Before there was any paint, there were the designs. Across the Western Desert of Australia, people had made them for a very long time on the ground and on the body: circles, arcs, and connecting lines smoothed into red sand or laid on in ocher, meant to be seen for the length of a ceremony and then swept flat again. A design of this kind was not a picture of a place. It was a statement about a place and about who belonged to it, and the right to make any particular one belonged to particular people and passed along particular lines of family.

Papunya was not a place any of those people had chosen. In the late 1960s the Australian government gathered several Western Desert groups into a single settlement about one hundred fifty miles northwest of Alice Springs. Pintupi, Luritja, Warlpiri, Arrernte, and Anmatyerre families found themselves living together in one small place, speaking different languages, a long way from the country whose designs they carried.

The change of surface changed everything about who could see the work. A design in sand lasted an afternoon and was seen by the people entitled to see it. A design on a board could be carried to Alice Springs, sold, and hung on a wall in another country, where anyone at all might stand in front of it. Within a few years the painters were hearing objections from other Aboriginal communities: certain knowledge was going out to strangers. The painters answered, and they answered on the boards. They stopped including ceremonial objects and decorated figures. They left marks out. They laid dots over designs until the shape underneath could not be read by anyone who did not already know it was there.

It is tempting to describe what happened at Papunya as a closed tradition being opened up. It is nearer the truth to say that the painters worked out, board by board, what a stranger was permitted to be shown. The paintings are finished works and partial records at the same time, and they are partial on purpose.

1 SUPPORTING IDEAS — MULTIPLE CHOICE

According to the passage, a desert design of the older kind was

A) made to last no longer than the ceremony it belonged to

B) painted in acrylic on scraps of board

C) shown mainly to visitors from outside the community

D) invented fresh by whoever happened to be making it

E) the government policy that gathered several Western Desert groups into a single settlement far from their own country

2 SUPPORTING IDEAS — MULTIPLE CHOICE

According to the passage, the families gathered at Papunya

A) came from several different groups and did not all speak the same language

B) invented fresh by whoever happened to be making it

C) had lived on that ground for many generations

D) had asked to be moved nearer to Alice Springs

E) all held the rights to the same designs

3 MAIN IDEA — MULTIPLE CHOICE

The passage as a whole is mainly concerned with

A) how a design tradition moved onto a surface that could travel, and who then decided what it showed

B) the government policy that gathered several Western Desert groups into a single settlement far from their own country

C) the mural painted on a school wall in 1971 and the company the painters afterward formed to sell their boards

D) the objections other Aboriginal communities raised once paintings on board were being sold and hung abroad

E) the painters had begun using materials their tradition had never used

4 INFERENCE — MULTIPLE CHOICE

The passage suggests that the objections described in lines 21-23 arose mainly because

A) all held the rights to the same designs

B) the painters had begun using materials their tradition had never used

C) the government had moved the groups far from their own country

D) a painting on board could be kept and studied by people who had no right to the design

E) the company formed at Papunya was selling the boards too cheaply

5 INFERENCE — MULTIPLE CHOICE

The passage indicates that dots were laid over some designs (lines 26-27) in order to

A) make the boards more attractive to buyers in other countries

B) paint in acrylic on scraps of board

C) let a board be shown to strangers without giving the design away

D) hide places where the paint on the board had been damaged

E) let a painter cover a large board more quickly

PASSAGE 2 · QUESTIONS 6–10

Our athletic director keeps saying that competition is what makes a team, and that a shorter season would make our teams soft. I have watched three seasons from the training room, and I think the schedule is doing the softening for us.

Start with the trainer's log, which anyone may ask to see. Last year it recorded forty-one injuries across the fall sports. Nine of them came from a collision or a fall. The other thirty-two were overuse injuries: shin splints, stress reactions, tendon inflammation, the slow damage that arrives when a joint is asked to do the same thing ten thousand times without a week off. Thirty-two of forty-one is not a run of bad luck. It is a schedule, and it can be written differently.

And the schedule is the part we control. Our varsity teams now play twenty-four games between the first week of September and the middle of November, which is eleven more than the same teams played a decade ago. The practice hour limits the district adopted look strict on paper — no more than twelve hours of organized practice a week — but they say nothing about games, and a game and the travel around it can swallow a school night whole. We did not lengthen practice. We simply added contests and called the extra hours something else.

The defenders of the long season have one honest argument, and it deserves a hearing: players get better by playing, and a team that meets fewer opponents is a team with fewer chances to learn. That is true. It is also true that the athletes who improved most last season were the ones who missed the least, and the ones who missed the most were the ones the log lists twice.

Cap the season at eighteen games. Keep the practice limits. Let the calendar breathe, and the competition the athletic director prizes will still be there in November, played by the people who started in September.

6 SUPPORTING IDEAS MULTIPLE CHOICE

According to the passage, the trainer's log for last year recorded

A) nine overuse injuries and thirty-two injuries from collisions or falls

B) forty-one overuse injuries across the fall sports

C) twelve injuries traced to the district's practice hour limits

D) thirty-two overuse injuries among forty-one injuries in all

E) begins two weeks earlier in September

7 SUPPORTING IDEAS MULTIPLE CHOICE

According to the passage, the varsity schedule now differs from the schedule of a decade ago in that it

A) contains eleven more games

B) begins two weeks earlier in September

C) allows twelve hours of practice a week rather than eight

D) ends in November rather than in October

E) coaches hold practices that the limits do not count as organized

8 TONE / STYLE / FIGURATIVE LANGUAGE MULTIPLE CHOICE

The writer's statement that "the schedule is doing the softening for us" (line 4) is best understood as

A) an admission that the writer's own team played badly last season

B) a literal description of what a training room log records

C) a warning that the season will be canceled if injuries continue

D) the limits were written before the fall season was lengthened

E) a turn of the athletic director's own word back against his position

9 INFERENCE MULTIPLE CHOICE

The passage suggests that the district's practice hour limits have not reduced what the athletes are asked to do because

A) coaches hold practices that the limits do not count as organized

B) allows twelve hours of practice a week rather than eight

C) the limits restrict practice while saying nothing about games or travel

D) twelve hours a week is more time than most of the sports require

E) the limits were written before the fall season was lengthened

10 VOCABULARY MULTIPLE CHOICE

As used in line 30, the word "breathe" most nearly means

A) recover from an illness

B) draw in air after hard exertion

C) a literal description of what a training room log records

D) have unfilled time in it

E) be spoken about openly at last

PASSAGE 3 · QUESTIONS 11–15

Before the light there is the heat, which is older,
and before the heat the dark, which is oldest,
and in the dark the proving drawer is working
at the one thing it does, which is to wait.
Flour to the forearm. A wrist that knows
how long is long enough without a clock.
The hands go in and the dough gives, and gives
in the particular way that means it is ready,
and the hands know this before the man does.
Trays go up. The oven takes them without comment.
Somewhere a van is already on its way
for bread that is not bread yet.
By the time the first light gets to the window
the work is two hours old and does not mention it.

11 MAIN IDEA — MULTIPLE CHOICE

The poem is primarily concerned with

A) the difficulty of getting up early
B) the history of traditional baking methods
C) a baker's pride in the quality of his bread
D) the failure of machines to replace craftsmen
E) skilled work carried out before anyone sees it

12 TONE / STYLE / FIGURATIVE LANGUAGE — MULTIPLE CHOICE

The poem describes the baker chiefly through

A) his conversation with the other workers
B) his memories of learning the trade
C) the appearance of the finished bread
D) his hands, which are said to know things before he does
E) his thoughts about the coming day

13 TONE / STYLE / FIGURATIVE LANGUAGE — MULTIPLE CHOICE

The tone of the poem is best described as

A) weary and resentful
B) tense and hurried
C) nostalgic and sad
D) playful and light
E) calm and contented

14 INFERENCE — MULTIPLE CHOICE

Line 12 suggests that the baker's work is

A) running behind the schedule it must keep
B) wasted more often than the baker admits
C) carried out without any plan
D) already committed to before it is finished
E) sold at a price fixed by the van driver

15 VOCABULARY — MULTIPLE CHOICE

In line 3, the word "proving" most nearly means

A) testing a theory
B) demonstrating skill
C) checking for faults
D) establishing the truth
E) letting dough rise

PASSAGE 4 · QUESTIONS 16–20

On the Mississippi floodplain, across the river from what is now St. Louis, a city stood nine hundred years ago that had no name anyone living remembers. Archaeologists call the place Cahokia, after a group of people who moved into the area centuries after it was empty. At its height, around the year 1100, it spread over several square miles and held perhaps ten thousand to twenty thousand people, a population in the same range as London's in that century. Roughly a hundred and twenty earthen mounds rose out of the flat ground. About eighty of them survive.

The largest is called Monks Mound. It is about a hundred feet high, and its base covers about as much ground as the base of the Great Pyramid does. Inside it are some twenty-two million cubic feet of earth, and every cubic foot of that arrived on somebody's back. There were no carts in North America then and no animals trained to pull them. The soil was dug with sticks and shells, packed into baskets, carried up the slope, and emptied out, and then the carrier walked back down for the next load. The work went on in stages for perhaps two centuries. From the summit a person commanded the whole floodplain, and everything below was arranged to be seen from there.

West of the mound the archaeologists found rings of postholes. The best known of them held forty-eight posts in a circle, with a forty-ninth at the center. Red cedar posts had stood in them, tall and evenly spaced. Standing at the center post on the right morning, an observer would have seen the sun come up directly behind one of the posts of the ring, and the posts that mattered were the ones that fixed the turning points of the year. A calendar in wood, on ground that floods, is not a casual object. Somebody had to plant it, check it, and replace it.

16 SUPPORTING IDEAS — MULTIPLE CHOICE

According to the passage, the earth that makes up Monks Mound was moved

A) by carts pulled by trained animals

B) by digging it from the river and floating it to the site

C) in baskets carried up the slope on people's backs

D) by cutting down a natural ridge that already stood there

E) were cut from red cedar rather than from another wood

17 SUPPORTING IDEAS — MULTIPLE CHOICE

According to the passage, the posts that mattered in the circle were the ones that

A) by carts pulled by trained animals

B) fixed the turning points of the year

C) stood taller than the rest of the ring

D) were cut from red cedar rather than from another wood

E) had to be replaced most often

18 VOCABULARY — MULTIPLE CHOICE

As used in line 19, the word "commanded" most nearly means

A) gave orders to

B) looked out over

C) demanded as a right

D) took charge of

E) by digging it from the river and floating it to the site

19 INFERENCE — MULTIPLE CHOICE

The passage most strongly suggests that the people who raised Monks Mound

A) worked at it only during the driest weeks of the year

B) had to be organized and directed across generations

C) borrowed the design from builders far to the south

D) lived on the summit once the work was finished

E) demanded as a right

20 SUPPORTING IDEAS — MULTIPLE CHOICE

What fact is established in lines 14-15 by "There were no carts"?

A) There were no carts in North America then and no animals trained to pull them.

B) the reasons the Mississippi floodplain was a hard place to farm

C) the methods archaeologists use to measure an earthen mound

D) by carts pulled by trained animals

E) by cutting down a natural ridge that already stood there

PASSAGE 5 · QUESTIONS 21–25

The photographs were not pictures of anything a visitor would have recognized. Each was a rectangle of glass, coated on one side, held under a telescope for hours while the light of dozens of stars fell on it. A prism in front of the lens spread every star's light into a band, so what came out of the darkroom was a plate covered with small gray smears, each smear one star's spectrum, crossed by fine dark lines where particular elements had absorbed particular colors.

By the 1880s the Harvard College Observatory was making these plates faster than anyone could read them, and its director, Edward Pickering, needed people to measure them. He hired women, and the reason he gave was budgetary and undisguised: women could be paid far less than men, so the same money bought more hands. Pay began at about twenty-five cents an hour. Over the following decades more than eighty women worked in those rooms, and they were known as the computers, because computing was then the name of the work and not yet of a machine.

The first sorting used letters. Spectra showing hydrogen most strongly were called A, the next B, and so on down the alphabet. Williamina Fleming, who had worked in Pickering's house as a maid before she worked in his observatory, devised much of that scheme and classified more than ten thousand stars with it. Antonia Maury pressed for something finer, arguing that a sorting quick enough to be simple was throwing away real differences. Annie Jump Cannon settled the quarrel by taking from both. She dropped the letters that were doing no work, put the survivors in a new order, O, B, A, F, G, K, M, and found that the sequence now ran smooth, each type shading into the next without a break.

Cannon classified about three hundred and fifty thousand stars in her lifetime, at times at three a minute. The scheme she settled is the one astronomers still use. It was assembled at twenty-five cents an hour, by women hired because they were cheap.

21 SUPPORTING IDEAS — MULTIPLE CHOICE

According to the passage, the prism in front of the telescope's lens

A) sharpened the image each star made on the glass

B) blocked the light of the brightest stars so that fainter ones would show

C) held the plate steady through the hours of the exposure

D) his belief that women had sharper eyesight for fine detail

E) spread each star's light into a band across the plate

22 INFERENCE — MULTIPLE CHOICE

It can be inferred from lines 11-14 that the reason Pickering gave for hiring women concerned

A) what he could get for the observatory's budget rather than any judgment about the work women could do

B) a shortage of men willing to measure photographic plates

C) his belief that women had sharper eyesight for fine detail

D) a rule at Harvard that required the observatory to employ them

E) setting out the objections raised against the letter scheme and leaving them unanswered

23 VOCABULARY — MULTIPLE CHOICE

As used in line 33, the word "settled" most nearly means

A) calmed

B) blocked the light of the brightest stars so that fainter ones would show

C) fixed in final form

D) paid in full

E) moved into

24 ORGANIZATION / LOGIC — MULTIPLE CHOICE

The fourth paragraph (lines 19-30) is organized chiefly by

A) explaining why hydrogen lines are the easiest feature of a spectrum to measure

B) contrasting the work done at Harvard with the work done at other observatories

C) setting out the objections raised against the letter scheme and leaving them unanswered

D) taking three workers in turn and showing what each one changed about the scheme

E) a shortage of men willing to measure photographic plates

25 SUPPORTING IDEAS — MULTIPLE CHOICE

In lines 11-14, "He hired women, and the reason" starts the evidence. Which choice follows?

A) explaining why hydrogen lines are the easiest feature of a spectrum to measure

B) He hired women, and the reason he gave was budgetary and undisguised: women could be paid far less than men, so the same money bought more hands.

C) the steps by which astronomers arrived at the classification of spectra they still use

D) blocked the light of the brightest stars so that fainter ones would show

E) a rule at Harvard that required the observatory to employ them

PASSAGE 6 · QUESTIONS 26–30

Start with the difficulty rather than the machine. A gravitational wave is a passing distortion of space itself: as it goes by, distances across it lengthen slightly in one direction while they shorten in the perpendicular one, and then the two swap. The trouble is the word slightly. The strongest events astronomers expect to see change a length by roughly one part in a thousand billion billion. Across an arm four kilometers long that comes to a shift of a few thousandths of the width of a single proton.

Nothing you could call a ruler survives that requirement, because a ruler laid across the wave is stretched by exactly the same fraction as the thing it is measuring. Any usable instrument has to compare one direction with another at the same instant, and it has to do so with something that is not itself a length.

Light is the something. Split a laser beam in two, send the halves down two arms set at right angles, bounce them off mirrors at the far ends, and bring them back together. If the arms are identical the returning waves cancel in a fixed way and the detector sits dark. Let one arm grow while the other shrinks, by however little, and the two beams arrive out of step and light appears where none was. That instrument is an interferometer, and its whole virtue is that it never measures a distance. It measures a difference.

Both did, on the fourteenth of September in 2015. The signal lasted a fraction of a second and climbed in pitch as it went, which is the sound of two black holes falling together somewhere over a billion light years away. The announcement came the following February. A century after the waves were predicted, the first thing anyone learned from one was that the instrument had been built correctly.

26 MAIN IDEA — MULTIPLE CHOICE

The passage as a whole is chiefly concerned with

A) the century that passed between the prediction of gravitational waves and their detection

B) how the design of the instrument follows from what makes the measurement hard

C) a ruler reports a length, and the wave changes a pitch

D) the two black holes whose collision produced the signal recorded in 2015

E) the reasons laser light is the most precise measuring tool available

27 SUPPORTING IDEAS — MULTIPLE CHOICE

According to the passage, an ordinary ruler cannot measure a gravitational wave because

A) moral goodness

B) the ruler is stretched by the same fraction as whatever it is laid across

C) no ruler can be manufactured to within a thousandth of a proton's width

D) the wave passes too quickly for any mark on it to be read

E) a ruler reports a length, and the wave changes a pitch

28 INFERENCE — MULTIPLE CHOICE

The passage suggests that an interferometer solves the problem stated in lines 11-16 because

A) a wave's opposite effects on two perpendicular arms show up as a difference between two beams

B) laser light travels faster than the wave that distorts the arms

C) the mirrors at the ends of the arms are unaffected by a passing wave

D) the detector sits dark whenever no measurement is being taken

E) the wave passes too quickly for any mark on it to be read

29 VOCABULARY — MULTIPLE CHOICE

As used in line 24, the word "virtue" most nearly means

A) moral goodness

B) the mirrors at the ends of the arms are unaffected by a passing wave

C) advantage

D) intention

E) accuracy

30 SUPPORTING IDEAS — MULTIPLE CHOICE

Lines 14-16 contain the words "Any usable instrument has to compare". What does that sentence establish?

A) the century that passed between the prediction of gravitational waves and their detection

B) the two black holes whose collision produced the signal recorded in 2015

C) Any usable instrument has to compare one direction with another at the same instant, and it has to do so with something that is not itself a length.

D) no ruler can be manufactured to within a thousandth of a proton's width

E) the reasons laser light is the most precise measuring tool available

PASSAGE 7 · QUESTIONS 31–35

A pointe shoe looks like a solid object, and it is not one. Under the pink satin of a traditional shoe there is no wood, no metal and no molded plastic anywhere. The stiff toe, which makers call the box, is a stack of fabric and paper layers, each wetted with paste, pressed together and shaped over a wooden form while the glue is still soft. Running back under the sole is the shank, a strip of leather, card, or burlap hardened with glue, and the shank is what holds the arch up when the dancer stands on the tip of the shoe. Paste, cloth and paper, dried hard and covered in satin: that is the entire mechanism, and every one of those layers is put down by hand.

Because it is dried paste, it behaves like dried paste. Sweat softens it. Bending it softens it. A shoe that felt like a plank on Monday can feel like a slipper by Friday, and in a demanding role a new pair may be finished by the end of one performance. Dancers call such a shoe dead, and the word is exact. A dead shoe can look almost new. The satin is fine, the ribbons are fine, and the support that made standing on the toe possible is simply gone.

None of this is a flaw that better manufacturing would cure. The same softness that kills the shoe is what allows it to be fitted to one particular foot. A pair arrives stiff and anonymous, and the dancer makes it hers before she ever wears it on stage, sewing on the ribbons and the elastic by hand, darning the flat tip so that it will grip the floor, scoring the sole so that it will not slide, bending the shank at the place where her own arch bends, and sometimes damping or warming one spot so that the glue lets go there and nowhere else.

31 MAIN IDEA — MULTIPLE CHOICE

Which of the following best expresses the main idea of the passage?

A) Pointe shoes have to be built entirely by hand because no machine can work with wet paste and paper layers.

B) Paste and cloth make the shoe wear out fast, and that same softness lets a dancer shape it to her foot.

C) The expense of buying several thousand pairs of pointe shoes a year is a serious burden on any ballet company.

D) A dancer must prepare each new pair by hand, sewing on the ribbons, darning the tip and bending the shank.

E) rubbing clean

32 SUPPORTING IDEAS — MULTIPLE CHOICE

According to the passage, the shank of a pointe shoe is

A) a stiffened strip under the sole that holds the arch up

B) the hardened toe on which the dancer stands

C) the ribbon that the dancer sews on by hand

D) the wooden form the shoe is shaped over

E) winning points with

33 SUPPORTING IDEAS — MULTIPLE CHOICE

According to the passage, a dancer prepares a new pair by doing all of the following EXCEPT

A) sewing on the ribbons and the elastic by hand

B) darning the flat tip of the shoe

C) the hardened toe on which the dancer stands

D) replacing the shank with a stronger one

E) bending the shank where her own arch bends

34 VOCABULARY — MULTIPLE CHOICE

As used in line 24, the word "scoring" most nearly means

A) keeping a record of

B) winning points with

C) cutting shallow lines into

D) rubbing clean

E) A dancer must prepare each new pair by hand, sewing on the ribbons, darning the tip and bending the shank.

35 SUPPORTING IDEAS — MULTIPLE CHOICE

What fact is established in line 12 by "Because it is dried paste"?

A) A dancer must prepare each new pair by hand, sewing on the ribbons, darning the tip and bending the shank.

B) Pointe shoes have to be built entirely by hand because no machine can work with wet paste and paper layers.

C) the hardened toe on which the dancer stands

D) Because it is dried paste, it behaves like dried paste.

E) bending the shank where her own arch bends

PASSAGE 8 · QUESTIONS 36–40

Two volcanoes can behave so unlike one another that they scarcely seem to belong to the same subject. One of them leaks a slow orange river down its own flank for months, and tourists photograph it from a road. The other stands quiet for centuries and then removes its own summit in an afternoon. The distinction is not a matter of size, or of age, or of what lies beneath the mountain. It comes down to two properties of the molten rock itself, and the second of them follows from the first.

The second property is dissolved gas. Every magma is charged with water vapor and carbon dioxide and sulfur dioxide, held in solution by the sheer weight of rock overhead. As the magma climbs, that weight falls away, and the gas comes out of solution as bubbles. What happens next is decided entirely by viscosity. In a fluid basalt the bubbles simply rise and leave, and the eruption is a fountain and then a flow. In a stiff, silica-rich magma the bubbles cannot travel; they grow where they are, and the pressure inside them climbs until the rock above gives way. A basalt lets its gas go the way an open bottle does. A rhyolite holds it the way a shaken one does, and gives it up all at once.

Mount Pinatubo, in the Philippines, made the case as plainly as any eruption on record. Its magma was dacite, a rock well up the silica range, and on 15 June 1991 the volcano threw an ash column to a height of thirty-four kilometers and delivered roughly seventeen million tons of sulfur dioxide into the stratosphere. The haze that resulted lowered the average temperature of the whole planet by about four tenths of a degree Celsius. No Hawaiian lava flow, however long it runs, does anything of the kind.

36 TONE / STYLE / FIGURATIVE LANGUAGE MULTIPLE CHOICE

The reference to bottles in lines 18-20 chiefly serves to

A) suggest that the difference between the two eruptions is smaller than it appears
B) introduce a measurement that the paragraph goes on to make precise
C) concede that the explanation is a simplification of a longer process
D) compare measurements taken by two rival groups of scientists
E) restate an unfamiliar mechanism in terms a reader already understands

37 SUPPORTING IDEAS MULTIPLE CHOICE

According to the passage, gas comes out of solution in a rising magma because

A) the temperature of the magma falls as it approaches the surface
B) the silica chains break apart and release the gas they had trapped
C) bubbles already present in the melt draw further gas into themselves
D) concede that the explanation is a simplification of a longer process
E) the weight of the rock overhead falls away as the magma climbs

38 ORGANIZATION / LOGIC MULTIPLE CHOICE

The passage is organized chiefly by

A) tracing the history of a single volcano from its first eruption to its last
B) naming two properties of magma and showing how each governs an eruption
C) listing the objections to a common explanation and answering them in turn
D) comparing measurements taken by two rival groups of scientists
E) the silica chains break apart and release the gas they had trapped

39 ORGANIZATION / LOGIC MULTIPLE CHOICE

The fourth paragraph (lines 21-29) functions chiefly to

A) introduce a difficulty for which the preceding explanation cannot account
B) tracing the history of a single volcano from its first eruption to its last
C) supply a documented case of the behavior the preceding paragraphs describe
D) qualify the claim that silica is the more important of the two properties
E) explain why an eruption of that size is unlikely to be repeated soon

40 SUPPORTING IDEAS MULTIPLE CHOICE

In lines 18-19, "A basalt lets its gas" starts the evidence. Which choice follows?

A) the temperature of the magma falls as it approaches the surface
B) tracing the history of a single volcano from its first eruption to its last
C) qualify the claim that silica is the more important of the two properties
D) the silica chains break apart and release the gas they had trapped
E) A basalt lets its gas go the way an open bottle does.

STOP If you finish before time is called, check your work in this section only. Don't turn to another section.

4

SECTION 4

Verbal

60 questions · 30 minutes

DIRECTIONS

Each question has five answer choices. Choose the best answer and fill in its circle on your answer sheet. This section has two parts: synonyms, then analogies.

Part 1 · Synonyms

Each question is a word in capital letters followed by answer choices. Choose the word or phrase whose meaning is closest to the word in capital letters.

1 SYNONYMS MULTIPLE CHOICE

BEWILDER

A) bewitch
B) confuse
C) contemplate
D) offend
E) reassure

2 SYNONYMS MULTIPLE CHOICE

WARY

A) cautious
B) fearless
C) menacing
D) nervous
E) weary

3 SYNONYMS MULTIPLE CHOICE

REINFORCE

A) enforce
B) rebuild
C) strengthen
D) taunt
E) weaken

4 SYNONYMS MULTIPLE CHOICE

MENTOR

A) apprentice
B) critic
C) employer
D) guide
E) mainstay

5 SYNONYMS MULTIPLE CHOICE

AFFABLE

A) abrasive
B) friendly
C) generous
D) gruff
E) talkative

6 SYNONYMS MULTIPLE CHOICE

QUELL

A) dominate
B) join
C) quail
D) spread
E) stop

7 SYNONYMS — MULTIPLE CHOICE

ABHOR

A) absorb
B) adore
C) endure
D) loathe
E) wallow

8 SYNONYMS — MULTIPLE CHOICE

REMORSE

A) excuse
B) pride
C) regret
D) revenge
E) solitude

9 SYNONYMS — MULTIPLE CHOICE

ARRAY

A) anomaly
B) display
C) handful
D) jumble
E) remnant

10 SYNONYMS — MULTIPLE CHOICE

AUSTERE

A) ancient
B) luxurious
C) plain
D) saturnine
E) sincere

11 SYNONYMS — MULTIPLE CHOICE

DOCILE

A) cheerful
B) fierce
C) imperious
D) learned
E) obedient

12 SYNONYMS — MULTIPLE CHOICE

BERATE

A) praise
B) scold
C) silence
D) summon
E) vex

13 SYNONYMS — MULTIPLE CHOICE

CEDE

A) grant
B) impose
C) receive
D) seize
E) withhold

14 SYNONYMS — MULTIPLE CHOICE

CONCILIATORY

A) soothing
B) stubborn
C) tactless
D) unanimous
E) wary

15 SYNONYMS — MULTIPLE CHOICE

DOGMATIC

A) hesitant
B) opinionated
C) practical
D) scholarly
E) tolerant

16 SYNONYMS — MULTIPLE CHOICE

ACRIMONY

A) affection
B) affront
C) bitterness
D) ceremony
E) patience

17 SYNONYMS MULTIPLE CHOICE

COALESCE

A) collapse
B) merge
C) scatter
D) solidify
E) unite

18 SYNONYMS MULTIPLE CHOICE

COHESION

A) unity
B) vagueness
C) variety
D) weakness
E) wrath

19 SYNONYMS MULTIPLE CHOICE

AFFLICTION

A) affectation
B) blessing
C) complaint
D) hardship
E) malaise

20 SYNONYMS MULTIPLE CHOICE

EQUANIMITY

A) allegiance
B) anger
C) calmness
D) equality
E) fairness

21 SYNONYMS MULTIPLE CHOICE

PALLIATE

A) adhere
B) aggravate
C) announce
D) delay
E) ease

22 SYNONYMS MULTIPLE CHOICE

INSUFFERABLE

A) dejected
B) inaudible
C) touchy
D) unbearable
E) welcome

23 SYNONYMS MULTIPLE CHOICE

QUASH

A) abdicate
B) approve
C) conceal
D) crush
E) question

24 SYNONYMS MULTIPLE CHOICE

RANCOR

A) affection
B) anchor
C) bitterness
D) discord
E) sweetness

25 SYNONYMS MULTIPLE CHOICE

VESTIGE

A) abundance
B) trace
C) treasure
D) vessel
E) vicissitude

26 SYNONYMS MULTIPLE CHOICE

INTRANSIGENT

A) inflexible
B) optimistic
C) transient
D) undecided
E) yielding

27 SYNONYMS — MULTIPLE CHOICE

PERSPICACIOUS

A) harmonious
B) incompatible
C) noncommittal
D) pellucid
E) shrewd

28 SYNONYMS — MULTIPLE CHOICE

ACUITY

A) antithesis
B) conjecture
C) enigma
D) keenness
E) maxim

29 SYNONYMS — MULTIPLE CHOICE

VACILLATE

A) decide
B) dismiss
C) eschew
D) select
E) waver

30 SYNONYMS — MULTIPLE CHOICE

EPHEMERAL

A) antiquated
B) archaic
C) durable
D) eternal
E) fleeting

Part 2 · Analogies

Each question begins with a relationship between two words. Choose the answer that completes the analogy so that it expresses the same relationship.

31 ANALOGIES — MULTIPLE CHOICE

surplus is to extra as

A) mason is to trowel
B) paragon is to novice
C) laurel is to victory
D) anomaly is to pattern
E) nourishment is to food

32 ANALOGIES — MULTIPLE CHOICE

agile is to quick as

A) saturnine is to gloomy
B) indomitable is to vulnerable
C) impetuous is to demure
D) adequate is to scarce
E) affable is to gruff

33 ANALOGIES — MULTIPLE CHOICE

sketch is to photograph as

A) contempt is to respect
B) invective is to outcry
C) omen is to sign
D) misconception is to misunderstanding
E) optician is to lens

34 ANALOGIES — MULTIPLE CHOICE

hurtle is to move as

A) move is to hurtle
B) soar is to jog
C) defy is to obey
D) guzzle is to drink
E) plummet is to step

35 ANALOGIES MULTIPLE CHOICE

valiant is to cowardly as

A) impervious is to fragile
B) ethereal is to distinct
C) reluctant is to unwilling
D) sycophantic is to flattering
E) jubilant is to joyful

36 ANALOGIES MULTIPLE CHOICE

clandestine is to secret as

A) astute is to shrewd
B) impetuous is to demure
C) complacent is to anxious
D) moist is to dry
E) effusive is to tranquil

37 ANALOGIES MULTIPLE CHOICE

fatigue is to error as

A) error is to fatigue
B) overgrazing is to erosion
C) larva is to beetle
D) slat is to blind
E) farmer is to plow

38 ANALOGIES MULTIPLE CHOICE

lens is to telescope as

A) telescope is to lens
B) sole is to shoe
C) cotton gin is to machine
D) tram is to vehicle
E) opal is to gem

39 ANALOGIES MULTIPLE CHOICE

basalt is to rock as

A) rock is to basalt
B) pressure is to diamond
C) prow is to vessel
D) fable is to story
E) bark is to trunk

40 ANALOGIES MULTIPLE CHOICE

facet is to gem as

A) gem is to facet
B) cheddar is to cheese
C) haiku is to poem
D) blueprint is to building
E) branch is to tree

41 ANALOGIES MULTIPLE CHOICE

barometer is to gauge as

A) magnet is to measure
B) filter is to refract
C) saw is to cut
D) telescope is to weigh
E) anchor is to divert

42 ANALOGIES MULTIPLE CHOICE

fracture is to injury as

A) injury is to fracture
B) optician is to lens
C) farce is to comedy
D) fret is to guitar
E) fin is to shark

43 ANALOGIES MULTIPLE CHOICE

exercise is to fatigue as

A) fatigue is to exercise
B) fracture is to injury
C) tide is to erosion
D) dove is to peace
E) mesa is to landform

44 ANALOGIES MULTIPLE CHOICE

lathe is to turn as

A) bellows is to smelt
B) loom is to shape
C) kiln is to sew
D) plow is to furrow
E) splint is to ship

45 ANALOGIES MULTIPLE CHOICE

sailor is to sextant as

A) sextant is to sailor
B) ballast is to stability
C) tragedy is to drama
D) seam is to garment
E) farmer is to plow

46 ANALOGIES MULTIPLE CHOICE

unanimous is to undivided as

A) abyss is to bottomless
B) sage is to solitary
C) orphan is to stingy
D) fugitive is to wandering
E) antique is to seasoned

47 ANALOGIES MULTIPLE CHOICE

mesa is to landform as

A) landform is to mesa
B) clarinet is to woodwind
C) chasm is to gap
D) shingle is to roof
E) curtain is to stage

48 ANALOGIES MULTIPLE CHOICE

rudder is to boat as

A) boat is to rudder
B) scene is to act
C) fog is to collision
D) ballad is to song
E) cotton gin is to machine

49 ANALOGIES MULTIPLE CHOICE

sprint is to jog as

A) jog is to sprint
B) hurtle is to fall
C) disseminate is to conceal
D) sob is to cry
E) lunge is to rise

50 ANALOGIES MULTIPLE CHOICE

hurricane is to storm as

A) storm is to hurricane
B) downpour is to drizzle
C) tile is to floor
D) leak is to damp
E) salmon is to fish

51 ANALOGIES MULTIPLE CHOICE

scaffold is to facade as

A) sapling is to tree
B) facade is to scaffold
C) cello is to instrument
D) pressure is to diamond
E) splint is to device

52 ANALOGIES MULTIPLE CHOICE

soar is to rise as

A) rise is to soar
B) sprint is to move
C) hurl is to toss
D) plummet is to step
E) assail is to admire

53 ANALOGIES MULTIPLE CHOICE

dune is to desert as

A) desert is to dune
B) mesa is to landform
C) step is to staircase
D) trumpet is to brass
E) blaze is to fire

54 ANALOGIES MULTIPLE CHOICE

salt is to preservation as

A) preservation is to salt
B) baker is to peel
C) larva is to beetle
D) humidity is to mildew
E) blaze is to fire

55 ANALOGIES MULTIPLE CHOICE

farmer is to plow as

A) plow is to farmer
B) pest is to blight
C) fern is to plant
D) exercise is to fatigue
E) diver is to tank

56 ANALOGIES MULTIPLE CHOICE

beacon is to warn as

A) lozenge is to soothe
B) lantern is to dim
C) mirror is to restrain
D) shovel is to vent
E) scarecrow is to store

57 ANALOGIES MULTIPLE CHOICE

kiln is to harden as

A) brush is to sculpt
B) gutter is to drain
C) easel is to furrow
D) latch is to smooth
E) lathe is to propel

58 ANALOGIES MULTIPLE CHOICE

probity is to honesty as

A) dissent is to compliance
B) yearning is to longing
C) finesse is to knack
D) harbinger is to hiatus
E) botanist is to press

59 ANALOGIES MULTIPLE CHOICE

vitriolic is to gentle as

A) desultory is to aimless
B) indomitable is to resilient
C) implacable is to belligerent
D) tenacious is to yielding
E) recalcitrant is to unruly

60 ANALOGIES MULTIPLE CHOICE

compassion is to cruelty as

A) credence is to belief
B) affinity is to zeal
C) blizzard is to storm
D) equanimity is to quirk
E) throng is to handful

STOP If you finish before time is called, check your work in this section only. Don't turn to another section.

5

SECTION 5

Quantitative 2

25 questions · 30 minutes

DIRECTIONS

Each question has five answer choices. Choose the best answer and fill in its circle on your answer sheet. Work the problems in your test book; scratch paper and calculators are not allowed. Figures are drawn as accurately as possible unless a note says otherwise.

1 GEOMETRY AND MEASUREMENT — MULTIPLE CHOICE

A parking garage's ticket kiosk is built as a regular nine-sided polygon. What is the measure, in degrees, of each of its interior angles?

A) 4

B) 40

C) 120

D) 126

E) 140

2 GEOMETRY AND MEASUREMENT — MULTIPLE CHOICE

A classroom's seating charts are kept in a storage box shaped like a rectangular prism, drawn in the figure below. How many vertices does the box have?

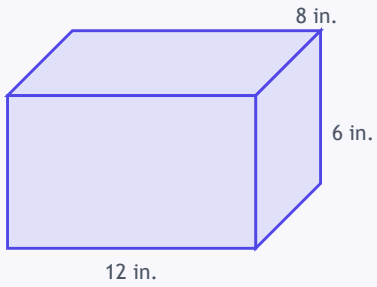


Figure not drawn to scale.

A) 6

B) 8

C) 12

D) 24

E) 42

3 ALGEBRA — MULTIPLE CHOICE

A price index tracking one basket of goods stands at 120 and rises 8 points a year. The basket must be replaced before the index reaches 180. For how many whole years can the index rise and still stay below 180?

A) 2.20

B) 7

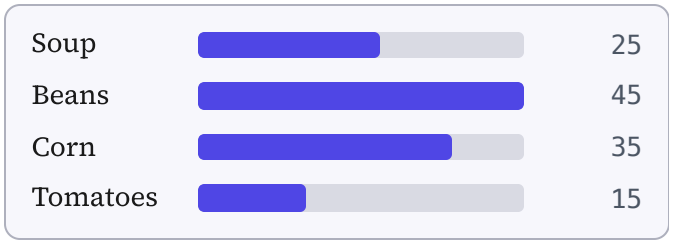
C) 8

D) 15

E) 22

4 DATA ANALYSIS AND PROBABILITY — MULTIPLE CHOICE

A pantry inventory is shown on a bar graph. The number of cans is printed at the end of each bar.



How many cans of soup and corn are on the shelf altogether?

A) -120

B) 12

C) 35

D) 60

E) 120

5 DATA ANALYSIS AND PROBABILITY — MULTIPLE CHOICE

A pantry holds 10 shelves of cans. The frequency table shows how many cans are on each shelf.

Cans on a shelf	1	3	6	10
Number of shelves	4	3	2	1

What is the mean number of cans per shelf?

A) -35

B) 3

C) 3.5

D) 5

E) 35

6 ALGEBRA — MULTIPLE CHOICE

A new employee's opening pay stubs each withhold one fixed dollar amount and one share of gross pay. The two stubs reduce to $4x + y = 23$ and $2x - y = 7$, in which x stands for the hourly rate in dollars and y for the fixed withholding in dollars. What is $x + y$?

A) 1

B) 2

C) 3

D) 5

E) 8

7 NUMBER SENSE AND OPERATIONS — MULTIPLE CHOICE

A balloon arch is built from a repeating color sequence. Last year's arch used 35 balloons. This year's arch uses 240% of that number. How many balloons does this year's arch use?

A) 14

B) 35

C) 41

D) 70

E) 84

8 GEOMETRY AND MEASUREMENT — MULTIPLE CHOICE

A metronome is turned on at 8:50 a.m. and turned off at 10:25 a.m. For how many minutes does it run?

A) 35

B) 87.50

C) 95

D) 145

E) 175

9 ALGEBRA — MULTIPLE CHOICE

A stamp album is marked $18 and a pack of mounting corners is marked $5. In a clearance the album's price is cut by a third, and $2 is then taken off the reduced price. The corners are not in the clearance. What is the album's clearance price?

A) $6

B) $7.50

C) $10

D) $12

E) $15

10 GEOMETRY AND MEASUREMENT — MULTIPLE CHOICE

A forestry crew measured a small sample plot and a large stand plot that are similar triangles, with corresponding sides in the ratio 2 : 5. The two are shown below.

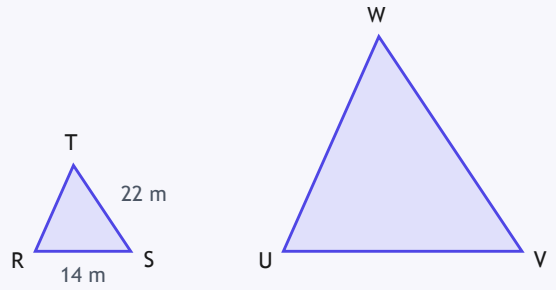


Figure not drawn to scale.

Triangle RST is similar to triangle UVW, with corresponding sides in the ratio 2 : 5.

The sample plot has an area of 60 square meters. What is the area of the stand plot, in square meters?

A) -1500
B) 150
C) 240
D) 375
E) 1,500

11 ALGEBRA — MULTIPLE CHOICE

What is the value of $20 - 3(x + 2)$ when $x = 4$?

A) 2
B) 8
C) 10
D) 18
E) 81

12 NUMBER SENSE AND OPERATIONS — MULTIPLE CHOICE

A balloon arch is built from a repeating color sequence. Counting from the first balloon, a red balloon is placed at every 6th position and a gold balloon at every 8th position. At which position does the arch first carry a red balloon and a gold balloon together?

A) 2
B) 4
C) 6
D) 14
E) 24

13 ALGEBRA — MULTIPLE CHOICE

If $x = 5$ and $y = -3$, what is the value of $2x - 4y$?

A) -81
B) -18
C) -2
D) 9
E) 22

14 ALGEBRA — MULTIPLE CHOICE

On a hiking map, the function $f(x) = 2x^2 + 3x$ converts a horizontal distance x, measured in hundreds of meters east of the trailhead, into an elevation change in meters. Distances west of the trailhead are negative. What is the value of $f(-6)$?

A) -90
B) -9
C) 54
D) 90
E) 126

15 GEOMETRY AND MEASUREMENT — MULTIPLE CHOICE

A course marshal measures a 6-foot post and finds that its shadow measures 8 feet. At that same moment a nearby light tower throws a shadow of 36 feet. The diagram below shows the two triangles.

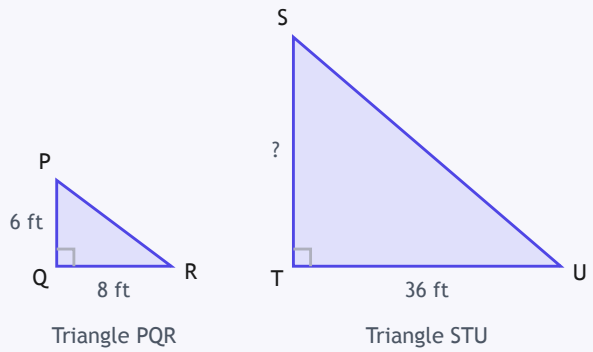


Figure not drawn to scale.

Triangle PQR ~ Triangle STU. PQ is the post and ST is the light tower; QR and TU are their shadows.

How many feet tall is the light tower?

A) 27
B) 34
C) 48
D) 216
E) 261

16 DATA ANALYSIS AND PROBABILITY — MULTIPLE CHOICE

Two schools publish the net cost a family pays after grant aid is subtracted. The table below lists five reported net costs at each school, in thousands of dollars.

School	Net costs, in thousands of dollars
Harrowgate Academy	9, 13, 14, 15, 19
Corvin Academy	11, 12, 14, 16, 17

By how many thousands of dollars does the larger of the two ranges exceed the smaller?

A) 4
B) 8
C) 10
D) 16
E) 61

17 GEOMETRY AND MEASUREMENT — MULTIPLE CHOICE

A wildflower meadow is divided into survey plots. One plot is a triangle with a base of 14 meters and a height of 9 meters measured at right angles to that base, and its longest slanted side is 15 meters. What is the area of the plot, in square meters?

A) 63
B) 105
C) 126
D) 201
E) 210

18 GEOMETRY AND MEASUREMENT — MULTIPLE CHOICE

Two flower beds are similar rectangles whose corresponding sides are in the ratio 2 to 5. The smaller bed covers 100 square feet. How many square feet does the larger bed cover?

A) -2500
B) 16
C) 250
D) 625
E) 2,500

19 NUMBER SENSE AND OPERATIONS — MULTIPLE CHOICE

In a spelling contest each contestant is given 1 1/2 minutes at the microphone. How many contestants can be heard in 18 minutes?

A) 12
B) 18
C) 27
D) 36
E) 63

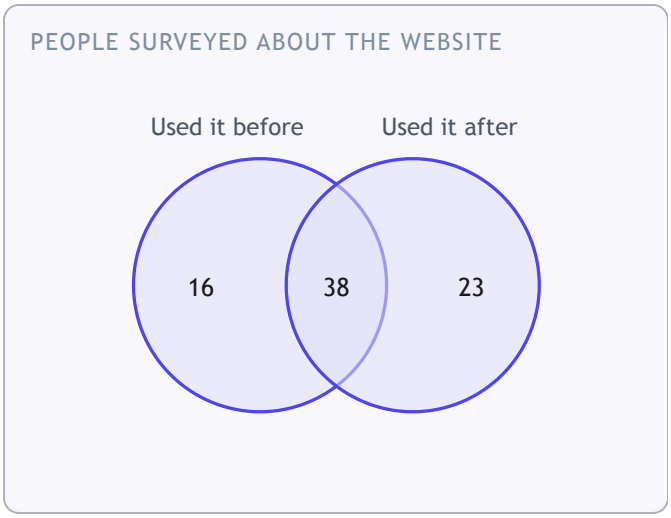
20 ALGEBRA — MULTIPLE CHOICE

A slow cooker is turned on and its temperature is read every hour. The first three readings, in degrees Fahrenheit, are 90, 104, and 118, and the temperature keeps climbing by the same amount each hour. What is the 9th reading?

A) 81
B) 202
C) 216
D) 230
E) 810

21 ALGEBRA — MULTIPLE CHOICE

Of 90 people surveyed about a website, 54 had used it before its redesign and 61 had used it after. The diagram below shows how the 90 divide.



How many of the 90 had used the site neither before nor after?

A) 0
B) 13
C) 15
D) 25
E) 51

22 NUMBER SENSE AND OPERATIONS — MULTIPLE CHOICE

A music stand holds one folder for each part, and 120 folders are shared among three parts in the ratio 2 : 3 : 5. How many folders go to the part with the largest share?

A) 5
B) 60
C) 96
D) 102
E) 120

23 ALGEBRA — MULTIPLE CHOICE

A dual-enrollment schedule gives a student 4 hours at the second campus in the first week and adds 3 hours in each week after that, with the rest of a 30-hour week spent at the first campus. In which week do the hours at the second campus first exceed 24?

A) 2

B) 4

C) 7

D) 8

E) 9

24 NUMBER SENSE AND OPERATIONS — MULTIPLE CHOICE

A bike rack has 40 spaces. By nine o'clock, 1/4 of the spaces in the rack are full. Between nine o'clock and noon, another 20% of the spaces in the rack are filled. How many spaces are still empty at noon?

A) 1

B) 10

C) 18

D) 22

E) 24

25 ALGEBRA — MULTIPLE CHOICE

A freight train is made up of identical cars. The mass w of one car, in metric tons, satisfies the equation $5w + 12 = 8w - 9$. What is the value of w?

A) 3

B) 4

C) 7

D) 12

E) 21

STOP If you finish before time is called, check your work in this section only. Don't turn to another section.

6

SECTION 6

Experimental

16 questions · 15 minutes · unscored

DIRECTIONS

This section tries out new questions for future tests. It does not count toward your score, but treat it like any other section. Each question has five answer choices. Choose the best answer and fill in its circle on your answer sheet.

1 SYNONYMS MULTIPLE CHOICE

ENCROACH

A) intrude
B) obstruct
C) preclude
D) prevent
E) thwart

2 SYNONYMS MULTIPLE CHOICE

SCHISM

A) coalition
B) consensus
C) courtesy
D) rift
E) spectator

3 SYNONYMS MULTIPLE CHOICE

SUPPLANT

A) amend
B) assimilate
C) displace
D) enhance
E) restore

4 ANALOGIES MULTIPLE CHOICE

sandal is to shoe as

A) shoe is to sandal
B) flood is to silt
C) brim is to hat
D) mast is to ship
E) cobra is to snake

5 ANALOGIES MULTIPLE CHOICE

mortar is to bond as

A) chimney is to drain
B) levee is to restrain
C) buttress is to cast
D) hammer is to soothe
E) shutter is to elevate

6 ANALOGIES MULTIPLE CHOICE

serene is to agitated as

A) exorbitant is to excessive
B) covert is to overt
C) parsimonious is to lavish
D) murky is to dim
E) diffident is to shy

PASSAGE 1 · QUESTIONS 7–11

The most consequential laboratory technique of the past twenty years was not designed. It was noticed, and it was noticed by people whose working problem was dairy. In 2007 the group published the explanation. The unique stretches between the repeats were pieces of viral DNA. A cell that had survived an infection kept a fragment of its attacker filed away and passed the file to its descendants. The pattern was not junk; it was a record, and the record was a defense. A strain's chances against a given phage could be read off what was written in it.

The mechanism is what made the finding portable. A stored fragment is copied into a short piece of RNA, called a guide RNA, and the guide leads a cutting protein to any stretch of DNA that matches it. In these bacteria that protein is Cas9. The guide finds; Cas9 cuts. Nothing in the arrangement cares whether the matched stretch belongs to a virus.

That indifference is the whole story of what happened next. If the guide can be written rather than inherited, the system becomes a way of cutting a chosen sequence in almost any genome, and in 2012 a laboratory demonstration showed that it could be done. Within a few years the technique was in use across biology.

It is worth being exact about the order of events, because the order is the point. Nobody set out to build a programmable pair of molecular scissors. A company set out to keep its cultures alive, cataloged an oddity in a genome, and found that bacteria had built the tool long ago and had been using it ever since. The instrument was not invented so much as translated.

7 MAIN IDEA — MULTIPLE CHOICE

According to the passage, the unique sequences lying between the repeats turned out to be

A) instructions for building the bacterium's own cell wall

B) pieces of DNA taken from viruses that had attacked the cell

C) copies of a gene the bacterium had received from a neighbor

D) errors introduced each time the genome was copied

E) protects the bacterium by binding to the virus itself

8 SUPPORTING IDEAS — MULTIPLE CHOICE

The passage states that a guide RNA

A) makes the copy of the phage fragment that is stored in the genome

B) protects the bacterium by binding to the virus itself

C) repairs the break that Cas9 leaves behind

D) leads a cutting protein to a stretch of DNA that matches it

E) name the laboratories that competed to publish first

9 INFERENCE — MULTIPLE CHOICE

In lines 24-30 the writer breaks off the account of the technique in order to

A) predict which fields will make the most use of it

B) grant that the finding may yet turn out to be mistaken

C) insist on the order in which the discovery actually came about

D) name the laboratories that competed to publish first

E) phage outbreaks turned out to trouble many other industries

10 VOCABULARY — MULTIPLE CHOICE

The passage suggests that the finding became useful outside dairy science chiefly because

A) the system does not distinguish viral DNA from any other kind

B) phage outbreaks turned out to trouble many other industries

C) the repeats had already been cataloged in other species by 1987

D) Cas9 proved able to work inside every known kind of cell

E) errors introduced each time the genome was copied

11 TONE / STYLE / FIGURATIVE LANGUAGE — MULTIPLE CHOICE

The passage as a whole is chiefly concerned with

A) the way bacteria defend themselves against the viruses that attack them

B) the commercial pressures that shape what a food company chooses to study

C) the difference between noticing a pattern in a genome and explaining what it is for

D) the repeats had already been cataloged in other species by 1987

E) a general tool that emerged from research aimed at a narrow problem

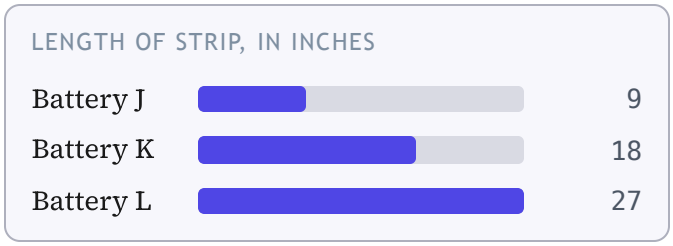
12 ALGEBRA — MULTIPLE CHOICE

A wholesaler quotes $8 for each case of juice and adds a flat $30 delivery charge to any order. A buyer has $190 to spend in all. What is the greatest number of cases the buyer can order?

A) 13.50
B) 19
C) 20
D) 23
E) 27

13 DATA ANALYSIS AND PROBABILITY — MULTIPLE CHOICE

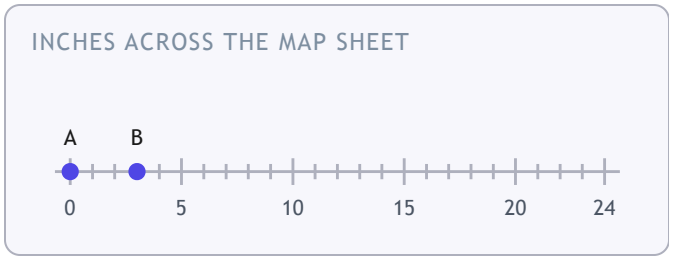
The result of a battery test is drawn as a strip on a sheet, where 3 inches of strip stands for 4 hours that a bulb stayed lit. The sheet is 30 inches wide, and the three strips drawn on it use 54 inches of strip in all. The graph below gives the length of the strip drawn for each battery. For how many hours did battery K keep its bulb lit?



A) 24
B) 40
C) 72
D) 216
E) 261

14 GEOMETRY AND MEASUREMENT — MULTIPLE CHOICE

A map of a railroad is drawn to a scale of 1 inch to 8 miles. The number line below runs along the top edge of the 24-inch map sheet and marks in inches where the two grade crossings A and B fall.



Each crossing closes for 5 minutes at a time. What is the actual distance between the two crossings, in miles?

A) 24
B) 40
C) 120
D) 129
E) 192

15 ALGEBRA — MULTIPLE CHOICE

A drum pattern is 7 beats long, and a drummer plays the pattern 58 times from end to end of a piece. Which of the following is closest to the total number of beats the drummer plays?

A) 56
B) 65
C) 350
D) 360
E) 400

16 NUMBER SENSE AND OPERATIONS MULTIPLE CHOICE

A bookstore expects 60 copies of a title to clear at full price in the first week, before any markdown is applied, and 75 copies actually clear. By what percent does the number that cleared exceed the number expected?

A) -125%

B) 15%

C) 20%

D) 25%

E) 125%

STOP If you finish before time is called, check your work in this section only. Don't turn to another section.

QUICK REFERENCE

Answer Key

Correct answers by section. Raw score = correct − ¼ × wrong (skips count 0).

SECTION 2 · QUANTITATIVE 1

1 D	2 E	3 E	4 B	5 C
6 E	7 C	8 A	9 E	10 D
11 D	12 A	13 A	14 D	15 C
16 A	17 D	18 C	19 A	20 C
21 B	22 B	23 B	24 E	25 B

SECTION 3 · READING

1 A	2 A	3 A	4 D	5 C	6 D	7 A	8 E	9 C	10 D
11 E	12 D	13 E	14 D	15 E	16 C	17 B	18 B	19 B	20 A
21 E	22 A	23 C	24 D	25 B	26 B	27 B	28 A	29 C	30 C
31 B	32 A	33 D	34 C	35 D	36 E	37 E	38 B	39 C	40 E

SECTION 4 · VERBAL

1 B	2 A	3 C	4 D	5 B	6 E	7 D	8 C	9 B	10 C
11 E	12 B	13 A	14 A	15 B	16 C	17 B	18 A	19 D	20 C
21 E	22 D	23 D	24 C	25 B	26 A	27 E	28 D	29 E	30 E
31 E	32 A	33 A	34 D	35 A	36 A	37 B	38 B	39 D	40 E
41 C	42 C	43 C	44 D	45 E	46 A	47 B	48 B	49 D	50 E
51 A	52 C	53 C	54 D	55 E	56 A	57 B	58 B	59 D	60 E

SECTION 5 · QUANTITATIVE 2

1 E	2 B	3 B	4 D	5 C
6 E	7 E	8 C	9 C	10 D
11 A	12 E	13 E	14 C	15 A
16 A	17 A	18 D	19 A	20 B
21 B	22 B	23 D	24 D	25 C

SECTION 6 · EXPERIMENTAL (UNSCORED)

1 A	2 D	3 C	4 E	5 B
6 B	7 B	8 D	9 C	10 A
11 E	12 C	13 A	14 A	15 E
16 D				

SCORING WORKSHEET

Score your test

Check your answers against the key, then fill in this table. Leave out the experimental section and the writing sample.

SCORE AREA	QUESTIONS	CORRECT	WRONG	RAW SCORE (CORRECT − ¼ × WRONG)
Verbal	60			
Quantitative (sections 2 + 5)	50			
Reading	40			

Turn raw scores into scaled scores. Upper Level scaled scores run 500–800 per section. Enter your raw scores in the free SSAT score calculator at **test-ninjas.com/ssat-score-calculator** to see estimated scaled scores and your total. The official conversion is set by equating each test form and isn't published, so treat the result as an estimate.

Keep your momentum. Review every question you missed in the Detailed Answer Key, then practice your weakest section with full-length SSAT tests and explained questions at **test-ninjas.com/ssat**.

TEST NINJAS PRACTICE ASSESSMENT

End of Practice Test

You have reached the end of this document. Review your work only when your instructor or testing conditions allow.

Test Ninjas SSAT® Upper Level Practice Test 1

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