HiSET™ Mathematics

Practice Test

Directions

This is a test of your skills in applying mathematical concepts and solving mathematical problems. Read each question carefully and decide which of the five alternatives best answers the question. Then mark your choice on your answer sheet.

There are relatively easy problems scattered throughout the test. Thus, do not waste time on problems that are too difficult; go on, and return to them if you have time.

Work as quickly as you can without becoming careless. Don't spend too much time on any question that is difficult for you to answer. Instead, skip it and return to it later if you have time. Try to answer every question even if you have to guess.

Mark all your answers on the answer sheet. Give only one answer to each question and make every mark heavy and dark, as in this example.

Correct
Ⓐ ⬤ Ⓒ Ⓓ

Incorrect
Ⓐ̸ Ⓧ Ⓖ Ⓦ

If you decide to change one of your answers, be sure to erase the first mark completely.

Be sure that the number of the question you are answering matches the number of the row of answer choices you are marking on your answer sheet.

Mathematics

Time — 60 minutes

32 Questions

1 A used motorcycle can be purchased for $500 cash or on credit with a $200 down payment plus payments of $70 per month for 5 months. How much would be saved by paying cash?

A $50
B $150
C $200
D $350
E $550

2 A solution of salt water is made by dissolving 2 grams of salt in 1 liter of water. Which of the following would yield a solution with the same concentration?

A   Dissolving $\frac{1}{2}$ gram of salt in 2 liters of water

B   Dissolving $\frac{1}{2}$ gram of salt in $\frac{1}{2}$ liter of water

C   Dissolving 1 gram of salt in $\frac{1}{2}$ liter of water

D   Dissolving 1 gram of salt in 2 liters of water

E   Dissolving 2 grams of salt in $\frac{1}{2}$ liter of water

3 An appliance store uses the following formula to set its selling prices.

Price = (actual cost) + (25 percent of actual cost)

If the actual cost of a refrigerator is $800, what price will the store set for the refrigerator?

A $200
B $600
C $800
D $1,000
E $1,400
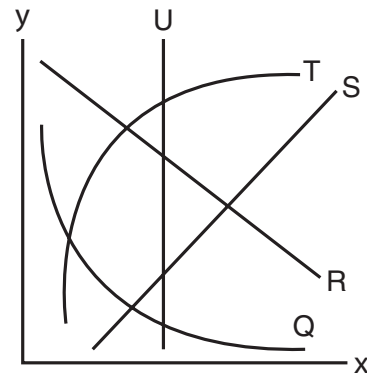
4 The following graph shows the sales figures for a toy company since it opened 10 years ago.

Toy Sales
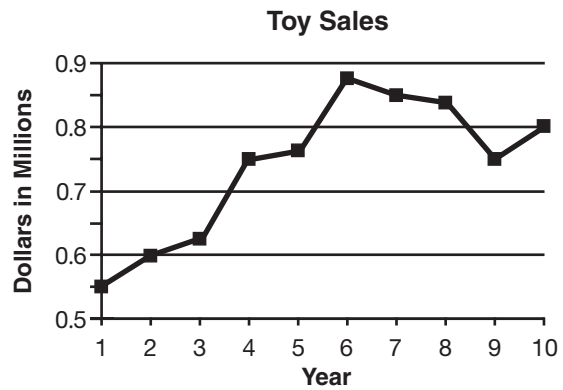
According to the graph, what was the approximate dollar value of sales in the company's 9th year of business?

A $75,000,000
B $7,500,000
C $750,000
D $75,000
E $7,500

5 Consider the graphs below.

Although the numbers are not included on either axis, it is possible to determine from shape and location that the equation $y = -1.2x + 4$ corresponds to graph

A   Q.
B   R.
C   S.
D   T.
E   U.

Directions: Questions 6 through 11 are based on the information below.

A city is going to build a new swimming pool at the recreation center. The illustration below shows the plans for the pool.
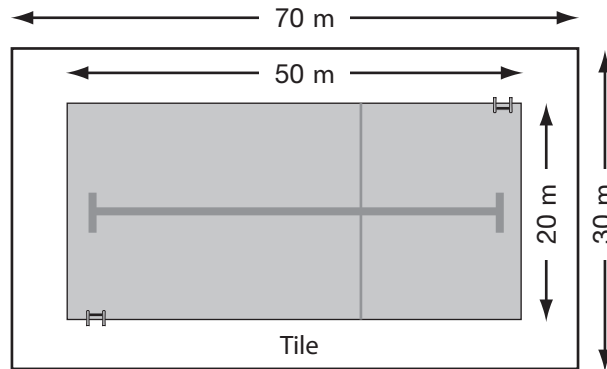
6 Assuming that the pool is 10 feet deep, approximately how many <u>cubic meters</u> of water will this pool hold when filled? **(3.3 feet ≈ 1 meter)**

A   1,000
B   3,000
C   10,000
D   30,000
E   100,000

7 If one box of tiles covers 10 square meters, which of the following represents the number of boxes required to cover the designated area around the pool with tile?

A $(70 \times 30) \div 10$
B $70 \times 30 \times 10$
C $(50 \times 20) \div 10$
D $[(70 \times 30) - (50 \times 20)] \div 10$
E $[(70 \times 30) - (50 \times 20)] \times 10$

8 The Recreation Department wants to put in swim lanes along the length of the pool. If each swim lane must be 8 feet wide, which of the following represents the best estimate for the number of swim lanes there can be in the pool **(3.3 feet ≈ 1 meter)**?

A $20 \div 8$
B $(20 \times 3.3) \div 8$
C $20 \div (3.3 \times 8)$
D $50 \div (8 \times 3.3)$
E $(50 \times 3.3) \div 8$

9 To maintain water purity, each week $1\frac{1}{2}$ kilograms of a certain chemical should be added for each million liters of water. If the pool contains 2.5 million liters of water, how many kilograms of the chemical should be added each week?

A   1.5
B   2.25
C   2.5
D   3.0
E   3.75

10 It is estimated that construction of this pool area will cost $75,000. A large corporation donated $35,000 toward the construction of the pool, and an additional $2,000 was earned during a local fund-raising activity. If 20 local businesses agree to donate the rest of the money, which of the following represents the average amount each business will have to contribute?

A $75,000 − $37,000

B ($75,000 − $2,000) ÷ 20

C 20 ÷ ($75,000 − $37,000)

D $75,000 ÷ 20

E ($75,000 − $37,000) ÷ 20

11 A larger diagram of the proposed swimming pool area will be presented to the city council. If each inch on that diagram represents 5 meters of actual distance, what are the overall dimensions of the pool area (including the tile area) in the diagram?

A 4 inches by 2 inches

B 10 inches by 4 inches

C 14 inches by 6 inches

D 250 inches by 100 inches

E 350 inches by 150 inches

12 The relationship between rate of speed (*r*), distance traveled (*d*), and time traveled (*t*) is given by the following equation.

$$r = \frac{d}{t}$$

If rate remains constant, which of the following must be true?

A When *t* remains constant, *d* increases.

B When *t* decreases, *d* remains constant.

C When *t* decreases, *d* increases.

D When *t* increases, *d* decreases.

E When *t* decreases, *d* decreases.

**13** Consider the equation $2x - 3 = 4$. To solve the equation for *x*, what would be the most logical first step?

A Add 3 to both sides of the equation.

B Subtract 3 from both sides of the equation.

C Divide both sides of the equation by −2.

D Multiply both sides of the equation by 2.

E Subtract 4 from both sides of the equation.

14 A tank for mixing chemical solutions is 1.5 meters long, 0.6 meters wide, and 1.5 meters deep. Which of the following represents the maximum number of cubic meters of solution this tank will hold?

A $(1.5 + 0.6) \times 1.5$

B $(1.5 + 1.5) \times 0.6$

C $1.5 \times 0.6 \times 1.5$

D $\dfrac{1.5 \times 1.5}{0.6}$

E $1.5 + 0.6 + 1.5$

Directions: Questions 15 through 17 are based on the graph below, which shows the percentages of the Earth's surface at various elevations.

Percentage of Earth's Crustal Surface at Various Elevations
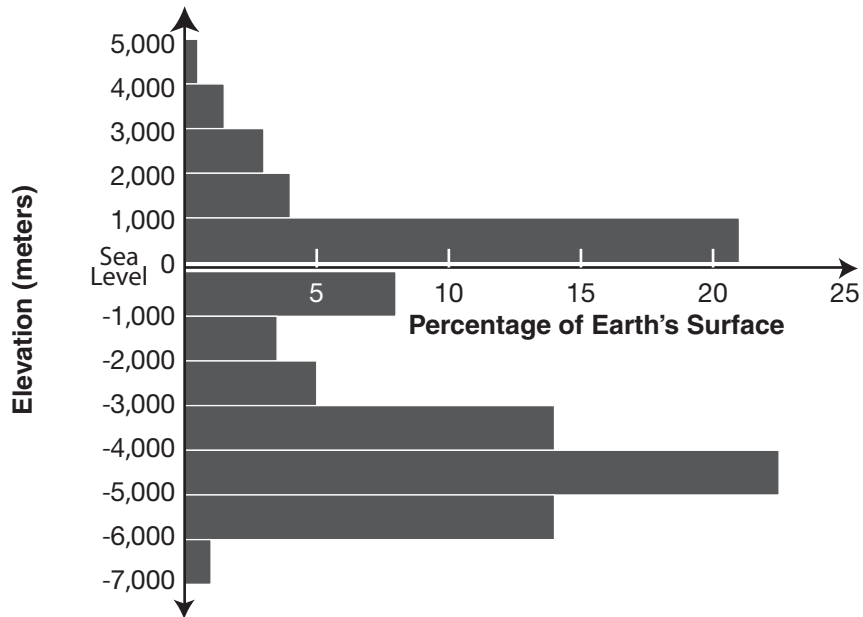
15 Approximately what percentage of the Earth's surface is at or above sea level?

    A   22%
    B   30%
    C   50%
   D   60%
    E   100%

16 Which of the following elevation intervals contains the highest percentage of the Earth's crustal surface?

    A   0 to 1,000
    B $-1,000$ to 0
    C $-4,000$ to $-3,000$
    D $-5,000$ to $-4,000$
    E $-6,000$ to $-5,000$

17 Which of the following best approximates the difference between the highest elevations and the lowest elevations of the Earth's crustal surface? $(1,000 \text{ m} = 1 \text{ km})$

    A   12 km
    B   8 km
    C   7 km
    D   5 km
    E   2 km

18 Consider the circle graph below.

Land and Water Areas on Earth
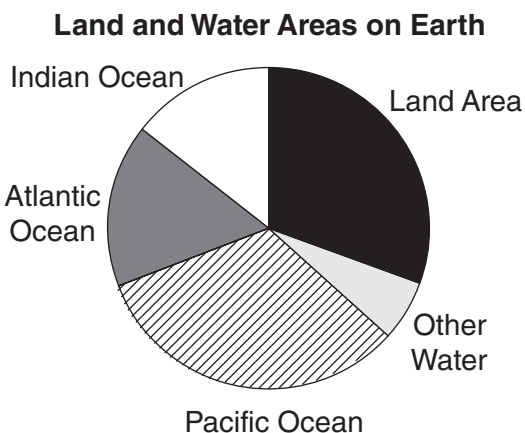
If the measure of the arc associated with the Pacific Ocean is approximately 125°, which of the following represents the proportion of Earth's surface that is covered by the Pacific Ocean?

A $\dfrac{125}{360-125}$

B $\dfrac{360-125}{360}$

C $\dfrac{360-125}{125}$

D $\dfrac{360}{125}$

E $\dfrac{125}{360}$

19 If the temperature at 8:00 A.M. was 22°F, and at 4:00 P.M. the same day, it was −2°F, what was the average temperature decrease per hour during this period?

A 2°F

B 2.5°F

C 3°F

D 5°F

E 6°F

20 Each month a lawn-care company sprays for weeds in 500 different yards. Last month, to determine the effectiveness of its herbicide, the company randomly selected 50 lawns for inspection. Of the lawns selected, 40 showed 5 or fewer weeds. Which of the following could the lawn company conclude with the greatest certainty?

A Exactly 80% of the lawns sprayed last month have 5 or fewer weeds.

B At least 80% of the lawns sprayed last month have exactly 5 weeds.

C More than 80% of the lawns sprayed last month have 5 or more weeds.

D It is very likely that more than half of the lawns sprayed last month have 5 or fewer weeds.

E It is very likely that more than half of the lawns sprayed last month have at least 5 weeds.

21 Which of the following correctly expresses *x* yards, *y* feet, and *z* inches in terms of inches?

A $36x + 12y + z$

B $x + 12y + 36z$

C $36x + 36y + z$

D $x + 36y + 36z$

E $x + 36y + 12z$

22 A fence encloses a rectangular field measuring 300 feet by 100 feet. A cow is tied to a fence post at one corner of the field. If the rope is 50 feet long, which of the following represents the grazing area of the cow inside the fence in square feet?

> Area of a circle = $\pi(\text{radius})^2$
> Area of a rectangle = length times width

A 300×100

B $(300 - 50) \times (100 - 50)$

C $\dfrac{\pi \times 50 \times 50}{4}$

D $\dfrac{\pi \times 50 \times 50}{2}$

E $(300 \times 100) - (50 \times 50)\pi$

23 The unit of measurement used to describe the energy produced by an atomic particle accelerator is the electron volt (eV). Shown below are the amounts of energy produced by two versions of a particle accelerator.

> Original Model 2×10^{10} eV
> New Model 8×10^{11} eV

How many more electron volts are produced by the new model as compared with the original model?

A 7.8×10^{11}

B 7.8×10^{10}

C 7.8×10^{9}

D 6×10^{1}

E 4×10^{1}

24 The diagram below shows a coordinate grid. What are the coordinates of the point where the graph of $y = -4x + 8$ intersects the x-axis?
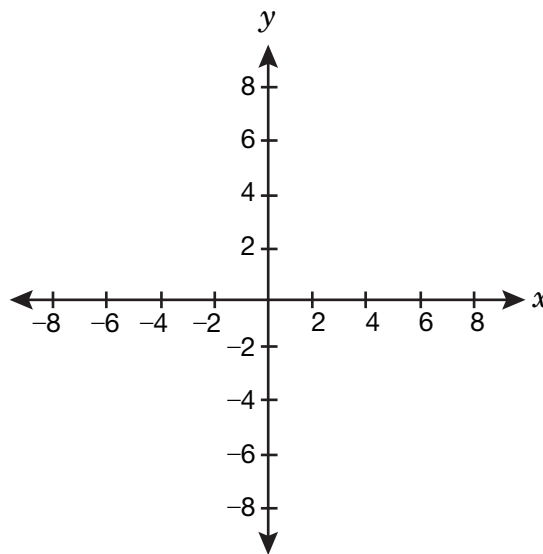

A $(2, 0)$

B $(8, 0)$

C $(0, -2)$

D $(0, -4)$

E $(0, 4)$

25 Kyle purchased a padlock with a resettable combination that uses 3 digits from 0 through 9 that must be entered in the proper order. A digit may be repeated in the combination. Which expression shows the total number of possible combinations for the padlock?

A 3^{10}

B 10^{3}

C $10 + 9 + 8$

D $(10)(9)(8)$

E $10 + 10 + 10$

26 Naomi is looking at a flying eagle, as shown in the diagram below.
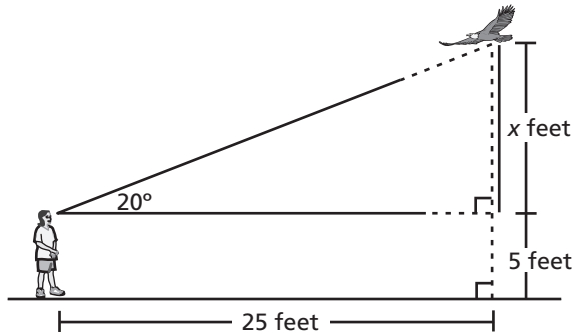
Which expression represents the eagle's height, in feet, above the ground?

A $\dfrac{25}{\tan 20} - 5$

B $\dfrac{25}{\tan 20} + 5$

C $20 \tan (25) + 5$

D $20 \tan (25) - 5$

E $25 \tan (20) + 5$

27 Simplify the following expression completely.

$$(\sqrt{3} + 2\sqrt{5})^2$$

A $2\sqrt{3} + 4\sqrt{5}$

B 23

C $3 + 8\sqrt{15}$

D $23 + 4\sqrt{15}$

E $25\sqrt{15}$

28 What equation represents the relationship that s is directly related to r and inversely related to t?

A $s = rt$

B $s = \dfrac{t}{r}$

C $s = \dfrac{r}{t}$

D $s = \dfrac{1}{rt}$

E $s = r + \dfrac{1}{t}$

29 If $f(x) = 3x^2 - x$, what is $f(x-1)$?

A $3x^2 - 7x + 2$

B $3x^2 - 7x + 4$

C $3x^2 - x - 4$

D $3x^2 - x - 2$

E $3x^2 - x + 2$

30 What are the real number solutions to the following equation?

$$x^2 + 4x - 32 = 0$$

A $\{-8, 4\}$

B $\{-4, 8\}$

C $\{-4 \pm 2\sqrt{7}\}$

D $\{-2 \pm 2\sqrt{7}\}$

E $\{-2 \pm 4\sqrt{7}\}$

31 Factor the following expression:
$2x^3 - 10x^2 - 12x.$

A $2x(x - 6)(x + 1)$
B $2x(x + 6)(x - 1)$
C $2x(x - 3)(x - 2)$
D $2x(x + 3)(x + 2)$
E $2x(x + 6)(x + 1)$

32 Suppose the functions $f(x)$ and $g(x)$ are inverse functions. About what line is the graph of $g(x)$ a reflection of the graph of $f(x)$?

A The x-axis
B The y-axis
C The line $y = 0$
D The line $y = x$
E The line $y = -x$

STOP

NO TEST MATERIAL ON THIS PAGE

Mathematics Practice Test
Answer Key

Question Number	Correct Answer
1	A
2	C
3	D
4	C
5	B
6	B
7	D
8	B
9	E
10	E
11	C
12	E
13	A
14	C
15	B
16	D
17	A
18	E
19	C
20	D
21	A
22	C
23	A
24	A
25	B
26	E
27	D
28	C
29	B
30	A
31	A
32	D