## DIRECTIONS

Read each question and choose the best answer. Then mark the space for the answer you have chosen.

**1.** **The national debt of the U.S. government was approximately $4,071,000,000,000 at the end of 1992. Which expression is another correct representation of this value?**

A $4.071 \times 10^{14}$

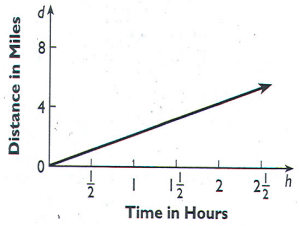
B $4.071 \times 10^{13}$

C $4.071 \times 10^{12}$

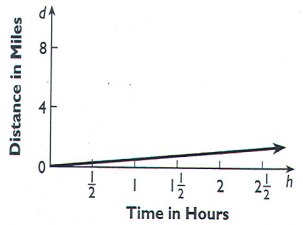
D $4.071 \times 10^{9}$

**2.** **Which graph best represents the distance covered by someone biking at a rate of 5 miles an hour?**

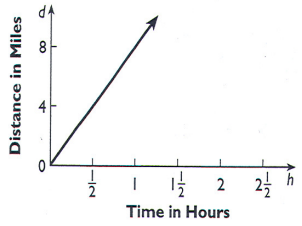
A




B




C

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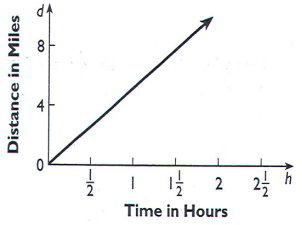



**3.** **Admission to a concert by the college orchestra was $6.50 for nonstudents and $3.00 for students. A group of students and nonstudents attended the concert and paid a total of $44.50 for their tickets. There were 9 people in the group. Solve the system of equations to find how many were students.**

$n + s = 9$

$6.50n + 3.00s = 44.50$

A 2

B 3

C 4

D 5

CONTINUE

**4.** **What are the solutions to this equation?**

$$2x^2 - x - 15 = 0$$

A 1, 15

B $-1, -15$

C $-\frac{5}{2}, 3$

D No solution

**5.** **Find $y^2 + x^2 - 3x - 10$ for $x = 2$ and $y = -2$**

A 12

B $-12$

C $-14$

D $-8$

**6.** **Which of the following is true?**

A $-4 > -1$

B $-12 < -7$

C $\frac{1}{2} < -\frac{1}{3}$

D $\frac{3}{4} > \frac{5}{6}$

**7.** **A ball is dropped from the top of a building. Its height above the ground $t$ seconds later is given by the function $h(t) = 90 - 4.9t^2$. Which best describes the type of function represented by $h(t)$?**

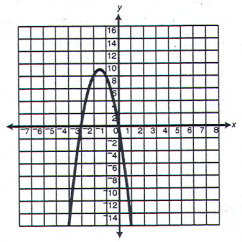
A Linear

B Non-linear

C Exponential

D Rational

**8.** **Choose the best estimate for the roots of the equation graphed below.**




A The equation has no real roots

B $x = -9,\ x = 1$

C $x = -3,\ x = 0$

D $x = -1,\ x = 9$

CONTINUE

9. A company has two ways to pay for its in-state telephone calls. It can pay a flat rate of $40 per month for all calls within its area code, or $9.50 for basic service plus 25 cents per minute for each long distance call within its area code. (All such calls are made at peak rate during regular business hours.) How many minutes of long distance calls are required before the flat-rate service is less expensive?

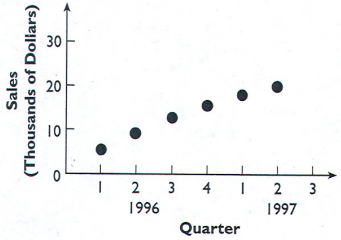
A 38

B 40

C 80

D 122

10. The scatter plot shows the sales at a new company over the last several quarters.




Which is the best estimate for the expected sales in the third quarter of 1997?

A $17,000

B $20,000

C $23,000

D $27,000

11. Nine is a square root of which number?

A 3

B 18

C 81

D 90

12. A storm center in the tropics is called a tropical depression if its top winds are less than 45 mi/h. If its top winds are at least 75 mi/h, it is classified as a hurricane. In between, it is a tropical storm. Which inequality gives the range of wind velocities, $v$, for a tropical storm?

A $75 < v \leq 45$

B $45 \leq v > 75$

C $45 \geq v > 75$

D $45 \leq v < 75$



14. What are approximate solutions of $5b^2 = 10$?

A 1.3 and $-1.3$

B 1.4 and $-1.4$

C 1.3 and $-1.4$

D 1.4 and $-1.3$

15. $f(x) = 3x^3 + 2x^2 + x + 1$ and $g(x) = x^3 - x^2 - x + 1$. What is $f(x) + g(x)$?

A $4x^3 + x^2 + 2$

B $2x^3 + 3x^2 + 2x$

C $4x^3 + 3x^2 + 2$

D $3x^3 - x^2 + 2$

16. In how many points does the graph of $f(x) = 2x^2 + 4x - 6$ intersect the $x$-axis?

A None

B One

C Two

D Three

18. **Which of the following illustrates the associative property of multiplication?**

A $x(y + z) = xy + xz$

B $x + y = y + x$

C $x \cdot (y \cdot z) = (x \cdot y) \cdot z$

D $x \cdot y = y \cdot x$

19. **Which expression is equivalent to $\frac{x^5y^4}{x^7y}$?**

A $x^2y^3$

B $\frac{y^3}{x^2}$

C $x^{12}y^5$

D $\frac{9}{8}$

20. **Which of the following equations represents direct variation?**

A $y = -4x$

B $y = \frac{-4}{x}$

C $y = -4x^2$

D $y = -4x^3$

21. **Which of the following tables is generated by $f(x) = \frac{1}{2}x + 1$?**

A

| $x$ | −2 | 0 | 2 |
|---|---|---|---|
| $f(x)$ | −1 | 1 | 2 |

B

| $x$ | −2 | 0 | 2 |
|---|---|---|---|
| $f(x)$ | 0 | 1 | 2 |

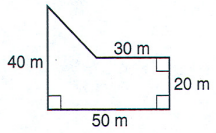
C

| $x$ | −2 | 0 | 2 |
|---|---|---|---|
| $f(x)$ | −3 | 1 | 5 |

D

| $x$ | −2 | 0 | 2 |
|---|---|---|---|
| $f(x)$ | −1 | 1 | 3 |

22. **Mr. Chen bought a house on a lot with the given shape.**




**What is the area of this lot?**

A 800 square meters

B 1000 square meters

C 1200 square meters

D 1400 square meters

23. **Which is an equation for the line passing through the point (−1, 4) and having a slope of 2?**

A $y = 2x + 6$

B $y = 2x - 3$

C $y = 2x - 6$

D $y = 2x + 3$

25. **The sum of spending money Jimmy received from his father for the months of March and April is $170. In April he received $150 less than three times the amount he received in March. What amount did he receive each month?**

A March: $80; April: $90

B March: $85; April: $95

C March: $78; April: $92

D March: $76; April: $94

29. **Susan uses 2 cups of rice when cooking a meal for her family, plus $\frac{1}{3}$ cup of rice for each guest. Which of the following equation represents the amount of rice, $r$, in cups, she uses as a function of the number of guests, $g$?**

A $r = \left(2 + \frac{1}{3}\right)g$

B $r = 2g + \frac{1}{3}$

C $r = 2 + \frac{g}{3}$

D $r = 2\left(\frac{g}{3}\right)$

30. **The element aluminum is a solid at temperatures below 660°C. Find the Fahrenheit temperatures for which aluminum is a solid.**

**(Use the formula $F = \frac{9}{5}C + 32$.)**

A $F \leq 349°F$

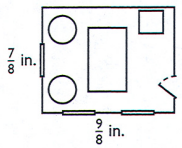
B $F \leq 1220°F$

C $F \leq 1246°F$

D $F \leq 1320°F$

CONTINUE

**31.** The floor plan for a meeting room is shown. The scale of $\frac{1}{16}$ inch in the drawing represents 1 foot in the actual room. Find the dimensions of the room.




A 14 feet by 18 feet

B 10.5 feet by 29 feet

C 14 feet by 13.5 feet

D 10.5 feet by 13.5 feet

**32.** "If we get enough rain, we will have a good harvest. If we have a good harvest, we can pay off our debts." The conclusion of the syllogism is

A We had a good harvest and paid off our debts.

B If we get enough rain, we can pay off our debts.

C If we paid off our debts, our harvest would be good.

D It rained and we had a good harvest.

**34.** A line perpendicular to $y = -4x + 2$ is to

A $y = 4x + 2.5$

B $y = \frac{1}{4}x + 10$

C $y = -4x - 2.5$

D $y = -\frac{1}{4}x + 10$

**40.** In 1990, the population density of California was about 73.669 people per square kilometer. What is that number rounded to the nearest tenth?

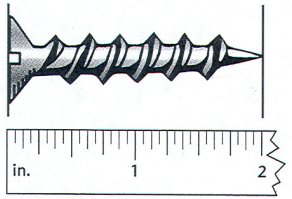
A 73.6

B 73.66

C 73.67

D 73.7

**41.** Find the approximate length of the screw shown in feet.




A 0.1458 ft

B 0.1667 ft

C 0.1875 ft

D 0.2083 ft

**42.** What unit would you use to measure the weight of a textbook?

A grams

B milligrams

C milliliters

D liters

**45.** How many solutions does the following system of equations have?

$$5y + 10z - 20 = 0$$

$$2.5y + 5z = 10$$

A 1

B 2

C No solutions

D Infinite solutions

**47.** If the graph of $y = x^2$ is reflected over the $x$-axis, what is the new equation of the graph?

A $y^2 = x$

B $y + x^2 = 0$

C $y^2 + x = 0$

D None of the above

CONTINUE

**49.** **Find the appropriate function that fits the data below:**

| $y$ | 1 | 3 | 5 | 7 |
|---|---|---|---|---|
| $f(y)$ | 1.65 | 4.48 | 12.18 | 33.12 |

**A** $f(y) = e^{\frac{1}{2}y}$

**B** $f(y) = \ln y$

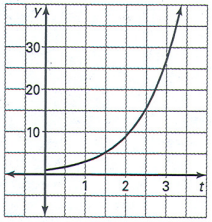
**C** $f(y) = y^2 - y$

**D** $f(y) = \frac{3}{2}y$

**50.** **The number of bacteria in a liquid culture is observed for three hours. The graph below represents this observation.**

**$t$ = time elapsed from the beginning of the experiment (in hours)**

**$y(t)$ = the number of cells at time $t$**




**What can you say about the growth of the number of bacteria?**

**A** There is a linear growth.

**B** There is a constant growth.

**C** There is an exponential growth.

**D** There is no growth.

**51.** **The data below shows:**

| $x$ | 3 | 4 | 5 | 6 |
|---|---|---|---|---|
| $y$ | 20 | 15 | 12 | 10 |

**A** Direct variation

**B** Joint variation

**C** Inverse variation

**D** None of the above

**52.** **The city's Board of Health reports that the measles infection has been spreading at the rate of 470 new cases per day for the last several days. If we start with 10,000 susceptible children, then we can expect 470 fewer susceptibles with each passing day. To find the number of remaining susceptibles after 3 days, what assumption must you hold?**

**A** The rate of new infections stays steady.

**B** The rate of new infections increases.

**C** The rate of new infections decreases.

**D** **B** or **C**

**53.** **A group of scientists observed the eating habits of the lions in an African Safari Park over a period of 3 years. They discovered that the lions would eat six different types of animals but would neither attack nor eat humans. What conclusion can be drawn from this research?**

**A** Lions will not eat prey beyond the six types observed

**B** Lions will never eat humans

**C** Lions are carnivores

**D** None of the above

**54.** **The heights of the players of a basketball team were measured to find the number of players in four different height ranges: 5'10" – 6'0", 6'1" – 6'3", 6'4" – 6'6", and 6'7" – 6'9". What type of display would best represent the data?**

**A** Bar graph

**B** Histogram

**C** Scatter plot

**D** Box plot

*CONTINUE*

**57.** Evaluate $x^3 - 2x + y$ for $x = 1$ and $y = 2$.

**A** 0

**B** 1

**C** 2

**D** 3

**58.** $f(x) = x^4 + x^3 + x^2 + x + x^{-1}$

$g(x) = -x^4 - x^3 - x^2 + x - \frac{1}{x}$

Find $f(x) + g(x)$.

**A** $2x$

**B** $2x + x^{-1} + \frac{1}{x}$

**C** $x$

**D** $-\frac{2}{x}$

**59.** Find $-\frac{1}{2}\begin{bmatrix} 3 & 4 \\ 10 & 200 \end{bmatrix}$.

**A** $\begin{bmatrix} \frac{3}{2} & 2 \\ 5 & 100 \end{bmatrix}$

**B** $\begin{bmatrix} -\frac{3}{2} & -2 \\ -5 & -100 \end{bmatrix}$

**C** $\begin{bmatrix} -6 & -8 \\ -20 & -400 \end{bmatrix}$

**D** $\begin{bmatrix} 6 & 8 \\ 20 & 400 \end{bmatrix}$

**60.** An edge of a cube has a length of 2 cm.
What is the total surface area of the cube?

**A** 12 $cm^2$

**B** 24 $cm^2$

**C** 48 $cm^2$

**D** 60 $cm^2$

*CONTINUE*