

SECTION 3: MATH TEST—NO CALCULATOR

25 Minutes • 20 Questions

TURN TO SECTION 3 OF YOUR ANSWER SHEET TO ANSWER THE QUESTIONS IN THIS SECTION.

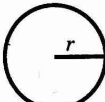
Directions: For Questions 1–15, solve each problem, select the best answer from the choices provided, and fill in the corresponding oval on your answer sheet. For Questions 16–20, solve the problem and enter your answer in the grid on the answer sheet. The directions before Question 16 will provide information on how to enter your answers in the grid.

ADDITIONAL INFORMATION:

- The use of a calculator is not permitted.
- All variables and expressions used represent real numbers unless otherwise indicated.
- Figures provided in this test are drawn to scale unless otherwise indicated.
- All figures lie in a plane unless otherwise indicated.
- Unless otherwise specified, the domain of a given function f is the set of all real numbers x for which $f(x)$ is a real number.

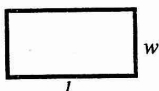
Reference Information

Circle:




$C = 2\pi r$
 $A = \pi r^2$

Rectangle:

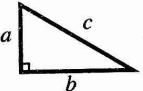


$A = lw$

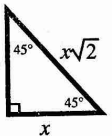
Triangle:

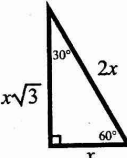


$A = \frac{1}{2}bh$

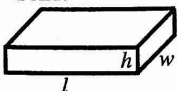


$a^2 + b^2 = c^2$






Rectangular Solid:



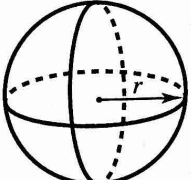
$V = lwh$

Cylinder:



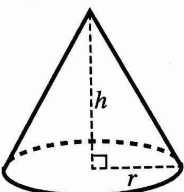
$V = \pi r^2 h$

Sphere:



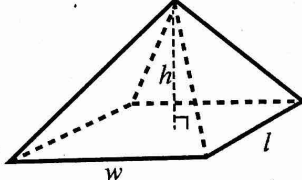
$V = \frac{4}{3}\pi r^3$

Cone:



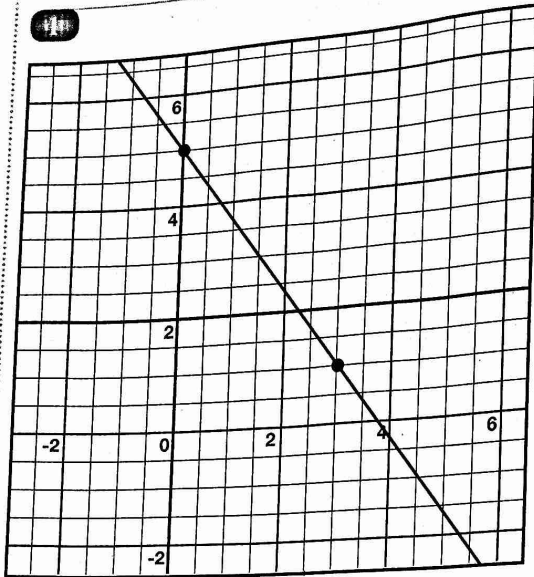
$V = \frac{1}{3}\pi r^2 h$

Rectangular Based Pyramid:



$V = \frac{1}{3}lwh$

The number of degrees of arc in a circle is 360.
 The number of radians in the arc of a circle is 2π .
 The sum of the measures in degrees of the angles of a triangle is 180.



If the line drawn above is translated 3 units to the left and 6 units down, what is the slope of the new line?

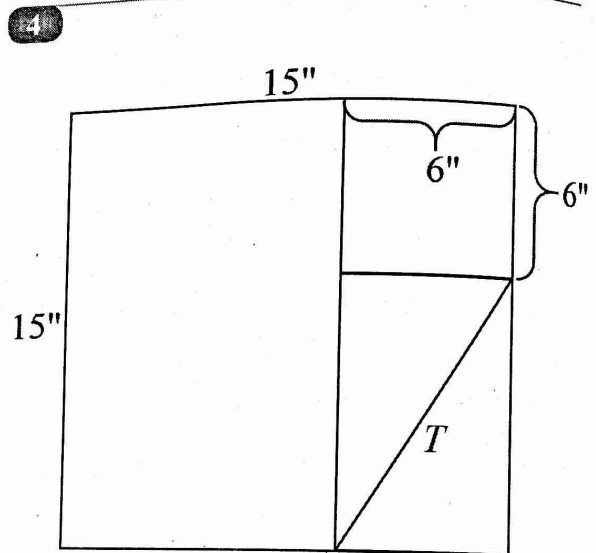
- (A) $-\frac{1}{9}$
- (B) $-\frac{4}{3}$
- (C) $-\frac{7}{10}$
- (D) -2

- 2 Catherine is performing a science experiment on the distance traveled by a snail. She sets the snail on her driveway and records the time it takes the snail to crawl to the end of her driveway. She uses the equation $D = 0.4t + 12$, where D is the total distance traveled, in feet, and t represents the time, in minutes. Which of the following statements best interprets the meaning of 12 in Catherine's equation?

- (A) It would take the snail 12 minutes to reach the end of the driveway.
- (B) The snail began 12 feet from the beginning of the driveway.
- (C) The snail traveled a total distance of 12 feet.
- (D) The snail traveled at a rate of 12 feet per minute.

- 3 If $-2x + 5 = 2 - (5 - 2x)$, what is the value of x ?

- (A) -2
- (B) 2
- (C) 3
- (D) 5



The figure shows one square inside another and a rectangle with diagonal T . The best approximation of the value of T , in inches, is given by which of the following inequalities?

- (A) $8 < T < 9$
- (B) $9 < T < 10$
- (C) $10 < T < 11$
- (D) $11 < T < 12$

- 5 The hypotenuse of a right triangle is 13 inches long. If the two legs are in a ratio of 2:3, what is the length, in inches, of the shorter leg?

- (A) $\sqrt{13}$
- (B) $\sqrt{26}$
- (C) $2\sqrt{13}$
- (D) $4\sqrt{13}$

- 6** A grain silo has a maximum capacity of 45,000 cubic feet. It currently contains 32,500 cubic feet of grain. Each week, farmers add 1000 bushels of grain. If one cubic foot is approximately 0.8 bushel, which of the following inequalities can be used to model the number of weeks, w , until the silo reaches its maximum capacity?

- (A) $32,500 + 1250w \leq 45,000$
(B) $32,500 + 800w \leq 45,000$
(C) $32,500 + 1250w \geq 45,000$
(D) $32,500 + 800w \geq 45,000$

- 7** The graph of $y = (3x - 4)(x + 3)$ is a parabola in the xy -plane. In which of the following equivalent equations do the x - and y -coordinates of the vertex show as constants or coefficients?

- (A) $y = 3x^2 + 5x - 12$
(B) $y = 3\left(x - \frac{4}{3}\right)\left(x - (-3)\right)$
(C) $y = 3\left(x^2 + \frac{5}{3}x - 4\right)$
(D) $y = 3\left(x - \left(-\frac{5}{6}\right)\right)^2 - \frac{169}{12}$

- 8** What is the difference when $-x - y$ is subtracted from $-x^2 + 2y$?

- (A) $-x^2 - x - 3y$
(B) $x^2 + 3y$
(C) $-x^2 + x + 3y$
(D) $-x^2 + x - 3y$

- 9** A semitruck has a fuel tank that holds 125 gallons of diesel fuel. When driven at 55 miles per hour, the truck can travel 6 miles on 1 gallon of fuel. If Jorge fills the tank in his truck and drives at 55 miles per hour, which of the following functions d shows the number of gallons of diesel fuel that remains after driving h hours?

- (A) $d(h) = 125 - \frac{6}{55h}$
(B) $d(h) = 125 - \frac{55h}{6}$
(C) $d(h) = \frac{125 - 6h}{55}$
(D) $d(h) = \frac{125 - 55h}{6}$

10 $A = \frac{M}{M - N}$

Which of the following expresses M in terms of the other variables?

- (A) $M = \frac{AN}{A - 1}$
(B) $M = \frac{AN}{1 - A}$
(C) $M = \frac{N}{A - 1}$
(D) $M = \frac{N}{1 - A}$

11 $y = 90x + 75$

Donna bought a sofa with 0% interest for the first 36 months. She makes a small down payment, and then she makes equal monthly payments until she pays off the sofa. The above equation models the number of payments, x , that she makes to pay for a sofa that costs y dollars. How many dollars was Donna's down payment?

- (A) 0
(B) 36
(C) 75
(D) 90



- 12 What is the sum of all values of n that satisfy $2n^2 - 11n + 15 = 0$?

(A) -11
(B) -5.5
(C) 5.5
(D) 15

- 13 The Matthews family is driving to the beach, which is 480 miles away. The function that represents the distance (in miles) and the time (in hours) it takes them to get to the beach is $f(t) = 480 - 60t$. In this equation, t is the independent variable, and $f(t)$ is the dependent variable. At which point does the graph of the function $f(t) = 480 - 60t$ cross the x -axis?

(A) (0, 6)
(B) (6, 0)
(C) (0, 8)
(D) (8, 0)

- 14 The population of a small town is growing. The town currently has 500 people. Based on the growth of the population in past years, it is estimated that after 1 year the population will be 650. Similarly, it is estimated that after 2 years, the population will be 845, and after 3 years, the population will be 1,099. Which of the following is an expression which represents the town's population growth?

(A) $500 \times 1.3x$
(B) $150x + 500$
(C) $500 \times (1.3)x^{-1}$
(D) $650 \times (1.3)x^{-1}t$

- 15 The expression $\frac{4x+1}{x+2}$ is equivalent to which of the following?

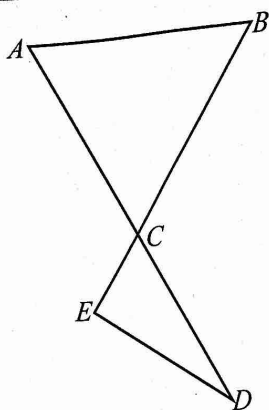
(A) $\frac{4+1}{2}$
(B) $4 + \frac{1}{2}$
(C) $4 + \frac{1}{x+2}$
(D) $4 - \frac{7}{x+2}$



18 $-9x + 5 = -9(x - b)$

For which value of b will this equation have infinitely many solutions?

16



In the figure above, $AC = BC$. If $m\angle B = 50^\circ$, what is the measure of $\angle ECD$? (Do not grid the degree symbol.)

19 If $f(x) = 5x + 12$, what is the value of $f(p + 3) - f(p)$?

17

$$\begin{aligned} 5x - 4y &= 13 \\ x + 2y &= 4 \end{aligned}$$

If (x, y) is a solution of the system of equations above, what is the value of the ratio $\frac{x}{y}$?

20

What is the sum of the solutions of the equation $\frac{9}{x-2} + \frac{16}{x+3} = 5$?

STOP

If you finish before time is called, you may check your work on this section only.
Do not turn to any other section.