

1. Marcus's favorite casserole recipe requires 3 eggs and makes 6 servings. Marcus will modify the recipe by using 5 eggs and increasing all other ingredients in the recipe proportionally. What is the total number of servings the modified recipe will make?
- A. 6
 - B. 8
 - C. 10
 - D. 12
 - E. 15

2. The 35-member History Club is meeting to choose a student government representative. The members decide that the representative, who will be chosen at random, CANNOT be any of the 3 officers of the club. What is the probability that Hiroko, who is a member of the club but NOT an officer, will be chosen?

F. 0

G. $\frac{4}{35}$

H. $\frac{1}{35}$

J. $\frac{1}{3}$

K. $\frac{1}{32}$

3. For what value of x is the equation $2^{2x+7} = 2^{15}$ true?

A. 2

B. 4

C. 11

D. 16

E. 44

4. Let the function f be defined as $f(x) = 5x^2 - 7(4x + 3)$.
What is the value of $f(3)$?

F. -18

G. -26

H. -33

J. -60

K. -75

5. A wallet containing 5 five-dollar bills, 7 ten-dollar bills, and 8 twenty-dollar bills is found and returned to its owner. The wallet's owner will reward the finder with 1 bill drawn randomly from the wallet. What is the probability that the bill drawn will be a twenty-dollar bill?

A. $\frac{1}{20}$

B. $\frac{4}{51}$

C. $\frac{1}{8}$

D. $\frac{2}{5}$

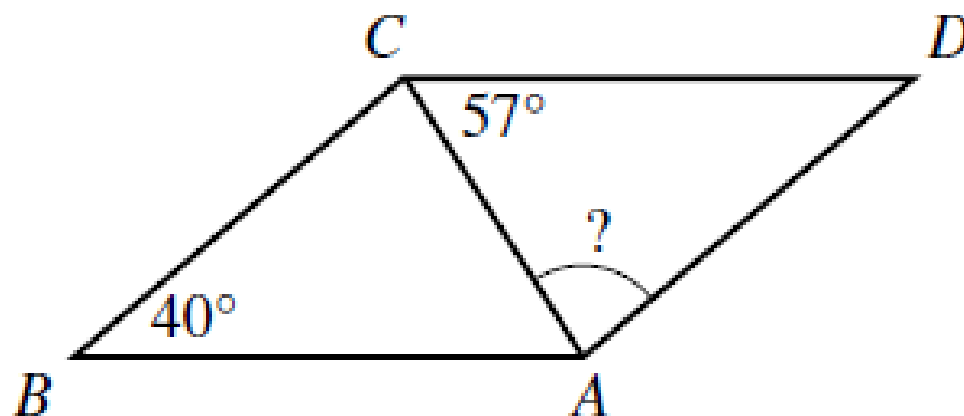
E. $\frac{2}{3}$

6. The ABC Book Club charges a \$40 monthly fee, plus \$2 per book read in that month. The Easy Book Club charges a \$35 monthly fee, plus \$3 per book read in that month. For each club, how many books must be read in 1 month for the total charges from each club to be equal?

- F. 1
- G. 4
- H. 5
- J. 6
- K. 75

7. In parallelogram $ABCD$ below, \overline{AC} is a diagonal, the measure of $\angle ABC$ is 40° , and the measure of $\angle ACD$ is 57° . What is the measure of $\angle CAD$?

- A. 40°
- B. 57°
- C. 77°
- D. 83°
- E. 97°



8. When $x = \frac{1}{2}$, what is the value of $\frac{8x-3}{x}$?

F. $\frac{1}{2}$

G. 2

H. $\frac{5}{2}$

J. 5

K. 10

9. In the standard (x,y) coordinate plane, what is the midpoint of the line segment that has endpoints $(3,8)$ and $(1,-4)$?

A. $(-2,-12)$

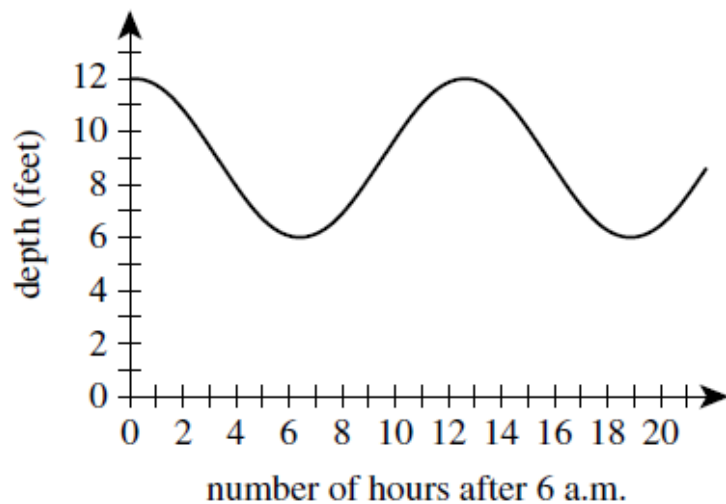
B. $(-1, -6)$

C. $\left(\frac{11}{2}, -\frac{3}{2}\right)$

D. $(2, 2)$

E. $(4,-12)$

10. The fluctuation of water depth at a pier is shown in the figure below. One of the following values gives the positive difference, in feet, between the greatest water depth and the least water depth shown in this graph. Which value is it?



- F. 3
- G. 6
- H. 9
- J. 12
- K. 19

11. What is the slope of the line through $(-2,1)$ and $(2,-5)$ in the standard (x,y) coordinate plane?

A. $\frac{3}{2}$

B. 1

C. -1

D. $-\frac{3}{2}$

E. -4

12. In Cherokee County, the fine for speeding is \$17 for each mile per hour the driver is traveling over the posted speed limit. In Cherokee County, Kirk was fined \$221 for speeding on a road with a posted speed limit of 30 mph. Kirk was fined for traveling at what speed, in miles per hour?

- F. 13
- G. 17
- H. 43
- J. 47
- K. 60

13. What is the sum of the solutions of the 2 equations below?

$$\begin{aligned}8x &= 12 \\ 2y + 10 &= 22\end{aligned}$$

- A. $2\frac{2}{5}$
- B. $7\frac{1}{2}$
- C. 9
- D. 10
- E. $17\frac{1}{2}$

14. The average of 5 distinct scores has the same value as the median of the 5 scores. The sum of the 5 scores is 420. What is the sum of the 4 scores that are NOT the median?
- F. 315
 - G. 320
 - H. 336
 - J. 350
 - K. 360

15. What is the value of the expression below?

$$| |-8 + 4| - |3 - 9| |$$

- A. -18
- B. -2
- C. 0
- D. 2
- E. 18

16. Which of the following expressions is equivalent to $x^{\frac{2}{3}}$?

F. $\frac{x^2}{3}$

G. $\frac{x(2)}{3}$

H. $\sqrt{x^3}$

J. $\sqrt[3]{x}$

K. $\sqrt[3]{x^2}$

17. In the standard (x,y) coordinate plane, what is the slope of the line given by the equation $4x = 7y + 5$?

A. $-\frac{4}{7}$

B. $\frac{4}{7}$

C. $\frac{7}{4}$

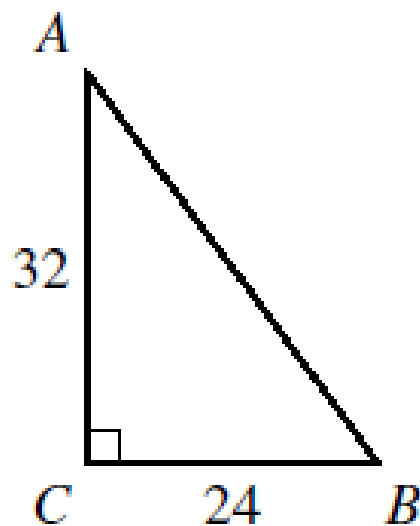
D. 4

E. 7

18. For which of the following conditions will the sum of integers m and n *always* be an odd integer?
- F. m is an odd integer.
 - G. n is an odd integer.
 - H. m and n are both odd integers.
 - J. m and n are both even integers.
 - K. m is an odd integer and n is an even integer.

19. The lengths of the 2 legs of right triangle $\triangle ABC$ shown below are given in inches. The midpoint of \overline{AB} is how many inches from A ?

- A. 16
- B. 20
- C. 21
- D. 28
- E. 40



20. In $\triangle DEF$, the length of \overline{DE} is $\sqrt{30}$ inches, and the length of \overline{EF} is 3 inches. If it can be determined, what is the length, in inches, of \overline{DF} ?

F. 3

G. $\sqrt{30}$

H. $\sqrt{33}$

J. $\sqrt{39}$

K. Cannot be determined from the given information

21. Laura plans to paint the 8-foot-high rectangular walls of her room, and before she buys paint she needs to know the area of the wall surface to be painted. Two walls are 10 feet wide, and the other 2 walls are 15 feet wide. The combined area of the 1 window and the 1 door in her room is 60 square feet. What is the area, in square feet, of the wall surface Laura plans to paint?
- A. 200
 - B. 340
 - C. 360
 - D. 390
 - E. 400

22. The length of a rectangle is 5 inches longer than the width. The perimeter of the rectangle is 40 inches. What is the width of the rectangle, in inches?

F. 7.5

G. 8

H. 15

J. 16

K. 17.5

23. 8% of 60 is $\frac{1}{5}$ of what number?

- A. 0.96
- B. 12
- C. 24
- D. 240
- E. 3,750

24. Armin is trying to decide whether to buy a season pass to his college basketball team's 20 home games this season. The cost of an individual ticket is \$14, and the cost of a season pass is \$175. The season pass will admit Armin to any home basketball game at no additional cost. What is the minimum number of home basketball games Armin must attend this season in order for the cost of a season pass to be less than the total cost of buying an individual ticket for each game he attends?

- F. 8
- G. 9
- H. 12
- J. 13
- K. 20

25. $\frac{4.8 \times 10^{-7}}{1.6 \times 10^{-11}} = ?$

A. 3.0×10^4

B. 3.0×10^{-4}

C. 3.0×10^{-18}

D. 3.2×10^{18}

E. 3.2×10^4

26. A circle in the standard (x,y) coordinate plane has center $C(-1,2)$ and passes through $A(2,6)$. Line segment \overline{AB} is a diameter of this circle. What are the coordinates of point B ?

F. $(-6,-2)$

G. $(-5,-1)$

H. $(-4,-2)$

J. $(4, 2)$

K. $(5,10)$

27. Which of the following expressions is a factor of $x^3 - 64$?

A. $x - 4$

B. $x + 4$

C. $x + 64$

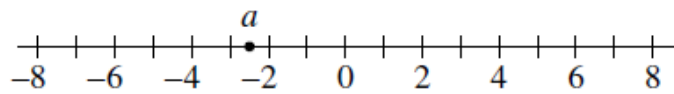
D. $x^2 + 16$

E. $x^2 - 4x + 16$

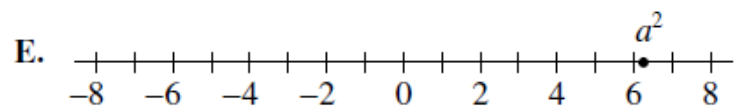
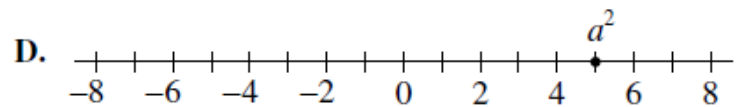
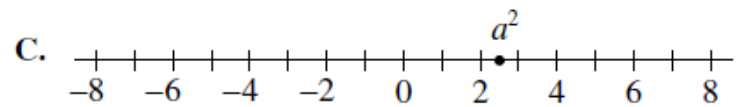
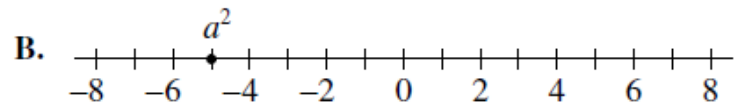
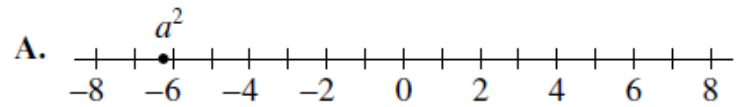
28. The average of a list of 4 numbers is 90.0. A new list of 4 numbers has the same first 3 numbers as the original list, but the fourth number in the original list is 80, and the fourth number in the new list is 96. What is the average of this new list of numbers?

- F. 90.0
- G. 91.5
- H. 94.0
- J. 94.5
- K. 94.8

29. The number a is located at -2.5 on the number line below.



One of the following number lines shows the location of a^2 . Which number line is it?



30. Maria ordered a pizza. She ate only $\frac{2}{9}$ of it and gave the remaining pizza to her 3 brothers. What fraction of the whole pizza will each of Maria's brothers receive, if they share the remaining pizza equally?

F. $\frac{7}{9}$

G. $\frac{3}{7}$

H. $\frac{1}{3}$

J. $\frac{7}{27}$

K. $\frac{2}{27}$