45 MINUTES, 31 QUESTIONS

This is just a practice sample

1

The total profit p, in dollars, from producing and selling x units of barbecue grill is given by the function $p(x) = kx - (b + 500)$, in which k and b are constants. When 120 barbecue grills were produced and sold, the total profit was \$15,000 and when 200 barbecue grills were produced and sold, the total profit was \$27,000. What is the value of b?

A) 1,850

B) 2,000

C) 2,250

D) 2,500

2

Arnold purchased a shirt and a pair of running shoes. The price of the shirt was s dollars and the price of the running shoes was 10 dollars less than twice the price of the shirt. He paid 8% tax for both the shoes and the shirt. If he paid 50% of the total purchase price with his debit card and paid the rest with cash, how much cash, in dollars, did he pay in terms of s?

A) $1.08s - 3.6$

B) $1.62s - 5.4$

C) $2.16s - 7.2$

D) $2.7s - 9$

3

A car traveled at an average speed of 65 miles per hour for 4 hours and consumed fuel at a rate of 32 miles per gallon. If the price of gasoline was \$2.79 per gallon, what was the cost of gasoline, to the nearest cent, for the four hour trip?

A) \$22.67

B) \$24.74

C) \$26.09

D) \$27.32

4

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

The table above shows some values of the linear function f. Which of the following defines f?

A) $f(x) = -\frac{1}{2}x + \frac{1}{2}$

B) $f(x) = -\frac{1}{2}x - \frac{1}{2}$

C) $f(x) = \frac{1}{2}x + \frac{1}{2}$

D) $f(x) = \frac{1}{2}x - \frac{1}{2}$

Questions 5 and 6 refer to the following information.

$$A = \frac{180(n-2)}{n}$$

The formula above shows the relationship between A, the measure of each angle of a regular polygon, and n, the number of sides of a regular polygon.

5

Which of the following expresses the number of sides in terms of the measure of an angle?

A) $n = \frac{A-180}{360}$

B) $n = \frac{A}{360} - 2$

C) $n = 180A - \frac{1}{2}$

D) $n = \frac{360}{180-A}$

6

For which of the following number of sides will the measure of an angle be 144 degrees?

A) 6

B) 8

C) 10

D) 12

7

If $5 - n \geq 2$, what is the greatest possible value of $n + 2$?

A) 2

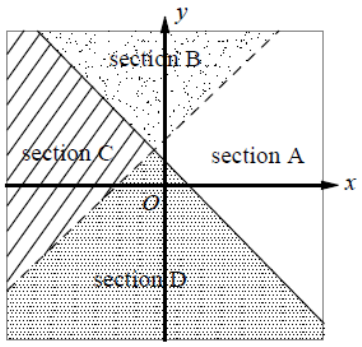
B) 3

C) 4

D) 5

8

$$\begin{cases} x - y < -2 \\ x + y \geq 1 \end{cases}$$



A graph and a system of inequalities are shown above. Which section of the graph could represent all of the solutions to the system?

A) Section A

B) Section B

C) Section C

D) Section D

9

A cubic meter of titanium weighs 4,540 kilograms. How much will 2,000 cubic centimeters of titanium weigh, in kilograms? (1 m = 100 cm)

A) 0.908

B) 9.08

C) 90.8

D) 908

10

When number n is divided by $\frac{2}{3}$, the result is the same as 6 less than $2n$. What is the value of $\frac{2}{3}n$?

A) 12

B) 10

C) 8

D) 6

Questions 11 and 12 refer to the following information.

Danny needs $450 to buy an iPad. He has already saved $120. He plans to earn the rest of the money by working at an office supply store. His savings can be modeled by the equation $y = 9.5x + 120$, in which x represents the number of hours he worked at the office supply store, and y represents his total savings.

11

Which of the following best describes the meaning of the number 9.5 in the equation?

A) The number of hours Danny works for the office supply store in one day.

B) The number of hours Danny works for the office supply store in one week.

C) The amount Danny get paid per day from the office supply store.

D) The amount Danny get paid per hour from the office supply store.

12

What is the minimum number of hours Danny needs to work at the office supply store to save enough money to buy an iPad?

A) 33 hours

B) 34 hours

C) 35 hours

D) 36 hours

13

If the average (arithmetic mean) of 2, a, and b is $2x$, what is the average of a and b in terms of x?

A) $2x-1$

B) $2x-2$

C) $3x-1$

D) $3x-2$

14

If a equals 120 percent of a number, then 40 percent of that number is

A) $\frac{1}{3}a$

B) $0.48a$

C) $3a$

D) $4.8a$

15

$$h=-4.9t^2+40t$$

The equation above expresses the height h, in meters, of an object t seconds after it is thrown into the air from the ground with an initial speed of 40 meters per second. After approximately how many seconds will the object reach its highest point?

A) 3

B) 4

C) 5

D) 6

16

The graph of a line on the xy-plane passes through points $(-3,1)$ and $(3,5)$. The graph of a second line contains the point $(6,0)$. If the two lines are parallel, what is the y-intercept of the second line?

A) -1

B) -2

C) -3

D) -4

17

The length and width of a large picture are respectively 18 inches and 12 inches. If each dimension is reduced by x inches to make the ratio of length to width 5 to 3, what is the value of x?

A) 6

B) 5

C) 4

D) 3

18

In a music store, 25% of the compact discs are classical. Out of these, 60% are on sale. If not more than 450 classical CDs are on sale, what could be the maximum number of CDs in the store?

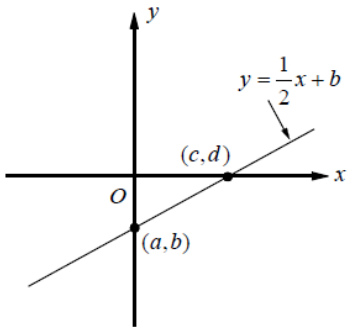
A) 2,600

B) 2,800

C) 3,000

D) 3,200

19



In the graph above, line $y=\frac{1}{2}x+b$ intersects the y- axis at point (a,b) and intersects the x- axis at point (c,d). If the value of b is equal to -3.5, what is the value of c?

A) 5.5

B) 7

C) 8.5

D) 10

20

If $y=kx^2$, in which k is a constant, and $y=-12$ when $x=-4$, what is the value of y when $x=2$?

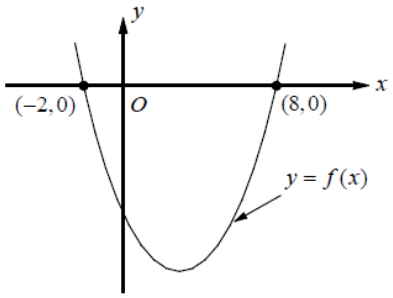
A) -6

B) -3

C) 3

D) 6

21



In the xy-plane above, $(-2,0)$ and $(8,0)$ are the two x-intercepts of the graph of f. If the minimum value of f is $-\frac{25}{2}$, which of the following is the y-intercept of the graph of f?

A) $(0,-8)$

B) $(0,-8\frac{1}{2})$

C) $(0,-9)$

D) $(0,-9\frac{1}{2})$

22

$$f(x) = -2(x^2 + 7x - 3) - a(x + 2) + 1$$

In the polynomial $f(x)$ defined above, a is a constant. If $f(x)$ is divisible by x, what is the value of a?

A) $-\frac{5}{2}$

B) -3

C) $\frac{7}{2}$

D) 5

23

$$f(x) = \frac{1}{3}x - k$$

In the function above, k is a constant. If $f(-3) = k$, what is the value of $f(-\frac{3}{2})$?

A) -1

B) $-\frac{1}{2}$

C) 0

D) 1

24

The value V, in dollars, of an artist's painting t years after it was purchased is given by the function $V(t) = 5,000(4)^{\frac{t}{10}}$. What is the value, in dollars, of the painting 15 years after it was purchased?

A) $\$28,000$

B) $\$32,000$

C) $\$36,000$

D) $\$40,000$

25

A water tank in the shape of a rectangular prism has a base length of 6 meters and a base width of 4 meters. In the morning, 120 cubic meters of water from the tank was used for planting. In the afternoon, 125 percent more than the amount of water used in the morning was pumped into the tank. What is the increase in the height of the water after the water was pumped into the tank, in meters?

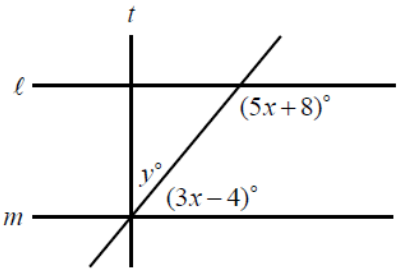
A) $1\frac{1}{4}$

B) $2\frac{3}{4}$

C) $4\frac{1}{2}$

D) $6\frac{1}{4}$

26



Note: Figure not drawn to scale.

In the figure above, $\ell \parallel m$ and $t \perp \ell$. What is the value of y?

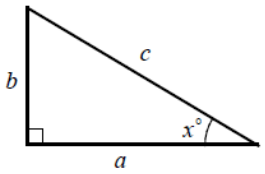
A) 24

B) 28

C) 32

D) 36

27



In the right triangle ABC above, which of the following must be true?

I. $\sin x^\circ = \frac{b}{c}$

II. $\cos(90 - x)^\circ = \frac{b}{c}$

III. $\sin(90 - x)^\circ = \frac{b}{c}$

A) I only

B) II only

C) I and II only

D) I and III only

28

Derek paid \$82 for one beanie and one mitten. If the beanie cost \$8 more than the mitten, how much did Derek pay for the beanie?

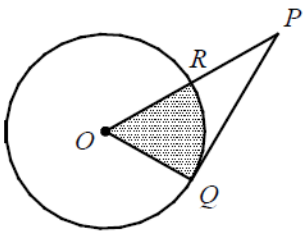
29

If the slope of a line in the xy-plane that passes through the points $(\frac{1}{2},-1)$ and $(2,b)$ is $\frac{8}{3}$, what is the value of b?

30

If x and y are positive integers, $x^2-y^2=\frac{8}{9}$, and $x^2+2xy+y^2=\frac{16}{9}$, what is the value of $x-y$?

31



In the figure above, the radius of circle O is 3. The line segment $\overline{PQ}$ is tangent to circle O and $OR = RP$. If the area of the shaded region is $k\pi$, what is the value of k?