1

If $\frac{x-1}{3} = k$ and $k = 3$, what is the value of x ?

A) 2

B) 4

C) 9

D) 10

2

For $i = \sqrt{-1}$, what is the sum $(7 + 3i) + (-8 + 9i)$?

A) $-1 + 12i$

B) $-1 - 6i$

C) $15 + 12i$

D) $15 - 6i$

3

On Saturday afternoon, Armand sent m text messages each hour for 5 hours, and Tyrone sent p text messages each hour for 4 hours. Which of the following represents the total number of messages sent by Armand and Tyrone on Saturday afternoon?

A) $9mp$

B) $20mp$

C) $5m + 4p$

D) $4m + 5p$

4

Kathy is a repair technician for a phone company. Each week, she receives a batch of phones that need repairs. The number of phones that she has left to fix at the end of each day can be estimated with the equation $P = 108 - 23d$, where P is the number of phones left and d is the number of days she has worked that week. What is the meaning of the value 108 in this equation?

A) Kathy will complete the repairs within 108 days.

B) Kathy starts each week with 108 phones to fix.

C) Kathy repairs phones at a rate of 108 per hour.

D) Kathy repairs phones at a rate of 108 per day.

CONTINUE

5

$$(x^2y - 3y^2 + 5xy^2) - (-x^2y + 3xy^2 - 3y^2)$$

Which of the following is equivalent to the expression above?

A) $4x^2y^2$

B) $8xy^2 - 6y^2$

C) $2x^2y + 2xy^2$

D) $2x^2y + 8xy^2 - 6y^2$

6

$$h = 3a + 28.6$$

A pediatrician uses the model above to estimate the height h of a boy, in inches, in terms of the boy's age a, in years, between the ages of 2 and 5. Based on the model, what is the estimated increase, in inches, of a boy's height each year?

A) 3

B) 5.7

C) 9.5

D) 14.3

7

$$m = \frac{\left(\frac{r}{1{,}200}\right)\left(1 + \frac{r}{1{,}200}\right)^N}{\left(1 + \frac{r}{1{,}200}\right)^N - 1} P$$

The formula above gives the monthly payment m needed to pay off a loan of P dollars at r percent annual interest over N months. Which of the following gives P in terms of m, r, and N ?

A) $P = \dfrac{\left(\frac{r}{1{,}200}\right)\left(1 + \frac{r}{1{,}200}\right)^N}{\left(1 + \frac{r}{1{,}200}\right)^N - 1} m$

B) $P = \dfrac{\left(1 + \frac{r}{1{,}200}\right)^N - 1}{\left(\frac{r}{1{,}200}\right)\left(1 + \frac{r}{1{,}200}\right)^N} m$

C) $P = \left(\dfrac{r}{1{,}200}\right) m$

D) $P = \left(\dfrac{1{,}200}{r}\right) m$

CONTINUE

8

If $\frac{a}{b} = 2$, what is the value of $\frac{4b}{a}$?

A) 0
B) 1
C) 2
D) 4

9

$$3x + 4y = -23$$
$$2y - x = -19$$

What is the solution (x, y) to the system of equations above?

A) $(-5, -2)$
B) $(3, -8)$
C) $(4, -6)$
D) $(9, -6)$

10

$$g(x) = ax^2 + 24$$

For the function g defined above, a is a constant and $g(4) = 8$. What is the value of $g(-4)$?

A) 8
B) 0
C) −1
D) −8

11

$$b = 2.35 + 0.25x$$
$$c = 1.75 + 0.40x$$

In the equations above, b and c represent the price per pound, in dollars, of beef and chicken, respectively, x weeks after July 1 during last summer. What was the price per pound of beef when it was equal to the price per pound of chicken?

A) $2.60
B) $2.85
C) $2.95
D) $3.35

12

A line in the xy-plane passes through the origin and has a slope of $\frac{1}{7}$. Which of the following points lies on the line?

A) (0, 7)
B) (1, 7)
C) (7, 7)
D) (14, 2)

13

If $x > 3$, which of the following is equivalent to $\dfrac{1}{\dfrac{1}{x+2}+\dfrac{1}{x+3}}$?

A) $\dfrac{2x+5}{x^2+5x+6}$

B) $\dfrac{x^2+5x+6}{2x+5}$

C) $2x+5$

D) x^2+5x+6

14

If $3x - y = 12$, what is the value of $\dfrac{8^x}{2^y}$?

A) 2^{12}

B) 4^4

C) 8^2

D) The value cannot be determined from the information given.

15

If $(ax+2)(bx+7) = 15x^2 + cx + 14$ for all values of x, and $a + b = 8$, what are the two possible values for c ?

A) 3 and 5

B) 6 and 35

C) 10 and 21

D) 31 and 41

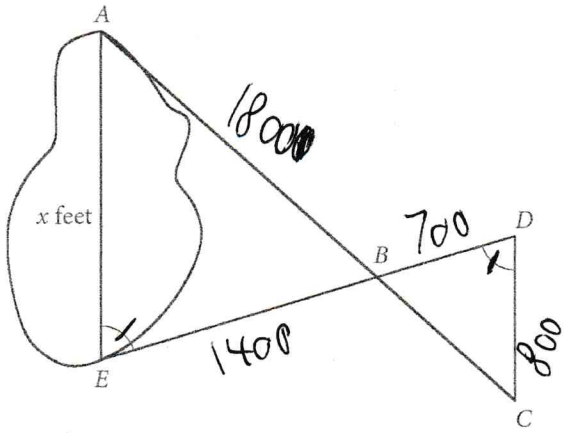
CONTINUE

16

If $t > 0$ and $t^2 - 4 = 0$, what is the value of t ?

$t = 2$

17



A summer camp counselor wants to find a length, x, in feet, across a lake as represented in the sketch above. The lengths represented by AB, EB, BD, and CD on the sketch were determined to be 1800 feet, 1400 feet, 700 feet, and 800 feet, respectively. Segments AC and DE intersect at B, and $\angle AEB$ and $\angle CDB$ have the same measure. What is the value of x ?

$\frac{700}{800} = \frac{1800}{x}$

$700x = 1400 \cdot 800$

18

$$x + y = -9$$
$$-x + 2y = 25$$

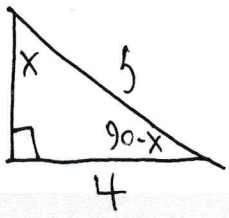
According to the system of equations above, what is the value of x ?

$-y = 16$

$x = 7$

19

In a right triangle, one angle measures $x°$, where $\sin x° = \frac{4}{5}$. What is $\cos(90° - x°)$?



$\frac{4}{5}$

20

If $a = 5\sqrt{2}$ and $2a = \sqrt{2x}$, what is the value of x ?

$2a = 5 \cdot 2\sqrt{2}$ $2a = \sqrt{2}\sqrt{x}$

$x = 100$

STOP

If you finish before time is called, you may check your work on this section only.

Do not turn to any other section.

$x = 1600$