Test #2

1

If $5x + 6 = 10$, what is the value of $10x + 3$?

A) 4

B) 9

C) 11

D) 20

2

$$x + y = 0$$
$$3x - 2y = 10$$

Which of the following ordered pairs (x, y) satisfies the system of equations above?

A) $(3, -2)$

B) $(2, -2)$

C) $(-2, 2)$

D) $(-2, -2)$

3

A landscaping company estimates the price of a job, in dollars, using the expression $60 + 12nh$, where n is the number of landscapers who will be working and h is the total number of hours the job will take using n landscapers. Which of the following is the best interpretation of the number 12 in the expression?

A) The company charges \$12 per hour for each landscaper.

B) A minimum of 12 landscapers will work on each job.

C) The price of every job increases by \$12 every hour.

D) Each landscaper works 12 hours a day.

4

$$9a^4 + 12a^2b^2 + 4b^4$$

Which of the following is equivalent to the expression shown above?

A) $(3a^2 + 2b^2)^2$

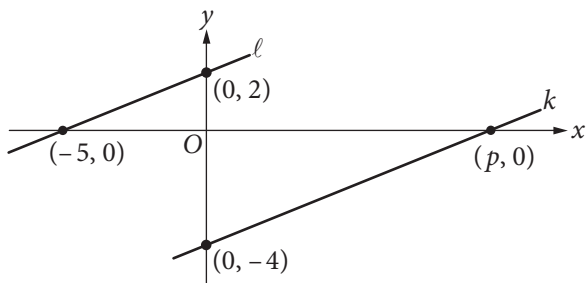B) $(3a + 2b)^4$

C) $(9a^2 + 4b^2)^2$

D) $(9a + 4b)^4$

5

$$\sqrt{2k^2 + 17} - x = 0$$

If $k > 0$ and $x = 7$ in the equation above, what is the value of k ?

A) 2

B) 3

C) 4

D) 5

6

In the xy-plane above, line ℓ is parallel to line k. What is the value of p ?

A) 4

B) 5

C) 8

D) 10

7

If $\dfrac{x^{a^2}}{x^{b^2}} = x^{16}$, $x > 1$, and $a + b = 2$, what is the value

of $a - b$?

A)   8

B) 14

C) 16

D) 18

8

$$nA = 360$$

The measure A, in degrees, of an exterior angle of a regular polygon is related to the number of sides, n, of the polygon by the formula above. If the measure of an exterior angle of a regular polygon is greater than $50°$, what is the greatest number of sides it can have?

A) 5

B) 6

C) 7

D) 8

CONTINUE

9

The graph of a line in the xy-plane has slope 2 and contains the point $(1, 8)$. The graph of a second line passes through the points $(1, 2)$ and $(2, 1)$. If the two lines intersect at the point (a, b), what is the value of $a + b$?

A)   4

B)   3

C) -1

D) -4

10

Which of the following equations has a graph in the xy-plane for which y is always greater than or equal to -1 ?

A) $y = |x| - 2$

B) $y = x^2 - 2$

C) $y = (x - 2)^2$

D) $y = x^3 - 2$

11

Which of the following complex numbers is equivalent to $\dfrac{3 - 5i}{8 + 2i}$? (Note: $i = \sqrt{-1}$)

A) $\dfrac{3}{8} - \dfrac{5i}{2}$

B) $\dfrac{3}{8} + \dfrac{5i}{2}$

C) $\dfrac{7}{34} - \dfrac{23i}{34}$

D) $\dfrac{7}{34} + \dfrac{23i}{34}$

12

$$R = \frac{F}{N + F}$$

A website uses the formula above to calculate a seller's rating, R, based on the number of favorable reviews, F, and unfavorable reviews, N. Which of the following expresses the number of favorable reviews in terms of the other variables?

A) $F = \dfrac{RN}{R - 1}$

B) $F = \dfrac{RN}{1 - R}$

C) $F = \dfrac{N}{1 - R}$

D) $F = \dfrac{N}{R - 1}$

CONTINUE ▶

13

What is the sum of all values of m that satisfy $2m^2 - 16m + 8 = 0$?

A) -8

B) $-4\sqrt{3}$

C) $4\sqrt{3}$

D) 8

14

A radioactive substance decays at an annual rate of 13 percent. If the initial amount of the substance is 325 grams, which of the following functions f models the remaining amount of the substance, in grams, t years later?

A) $f(t) = 325(0.87)^t$

B) $f(t) = 325(0.13)^t$

C) $f(t) = 0.87(325)^t$

D) $f(t) = 0.13(325)^t$

15

The expression $\dfrac{5x - 2}{x + 3}$ is equivalent to which of the following?

A) $\dfrac{5 - 2}{3}$

B) $5 - \dfrac{2}{3}$

C) $5 - \dfrac{2}{x + 3}$

D) $5 - \dfrac{17}{x + 3}$

16

The sales manager of a company awarded a total of $3000 in bonuses to the most productive salespeople. The bonuses were awarded in amounts of $250 or $750. If at least one $250 bonus and at least one $750 bonus were awarded, what is one possible number of $250 bonuses awarded?

17

$$2x(3x + 5) + 3(3x + 5) = ax^2 + bx + c$$

In the equation above, a, b, and c are constants. If the equation is true for all values of x, what is the value of b ?

18
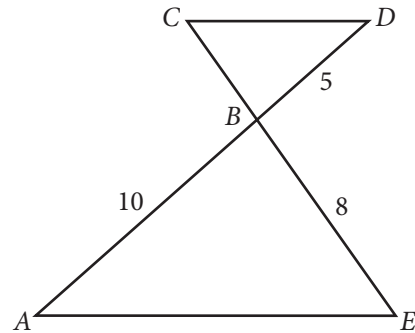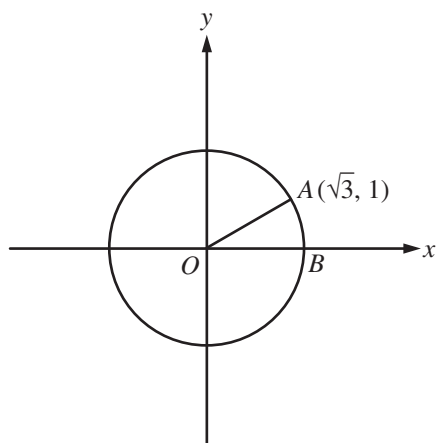

In the figure above, $\overline{AE} \parallel \overline{CD}$ and segment AD intersects segment CE at B. What is the length of segment CE ?

19

In the *xy*-plane above, O is the center of the circle, and the measure of $\angle AOB$ is $\dfrac{\pi}{a}$ radians. What is the value of a ?

20

$$ax + by = 12$$
$$2x + 8y = 60$$

In the system of equations above, a and b are constants. If the system has infinitely many solutions, what is the value of $\dfrac{a}{b}$?

STOP

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