EXERCISE 2: Answers for this exercise start on page 321.

1

$$\sqrt{x-1}-2=11$$

What value of x is the solution to the given equation?

170

2

If $\frac{5x}{6}-4=12-\frac{7x}{6}$, what is the value of $4x$?

52

3

$$B+8A=5(4C+B)$$

The given equation can be rewritten as $B=mA-nC$, where m and n are constants. What is the value of $m+n$?

7

4

$$(2x+7)^2=25$$

What is the sum of the solutions to the given equation?

-7

-6-1=-7

5

$$\frac{2}{3}t+m=40$$

A tennis player uses the given equation to estimate the tension t, in pounds, in his racquet strings after m tennis matches. Which of the following equations correctly expresses t in terms of m ?

A) $t=-\frac{3}{2}(40-m)$

B) $t=-\frac{3}{2}(40)-m$

C) $t=\frac{3}{2}(40-m)$

D) $t=\frac{3}{2}(40)-m$

6

$$\frac{3}{5}(x+11)-\frac{2}{3}(x+11)=-8$$

What value of x is the solution to the given equation?

109

7

If $\frac{4}{k+2}=\frac{x}{3}$, where $k\neq -2$, which equation correctly expresses k in terms of x ?

A) $k=\frac{12-2x}{x}$

B) $k=\frac{12+2x}{x}$

C) $k=\frac{x}{12+2x}$

D) $k=12x-2$

8

$$\sqrt{x^2+p^2}=q$$

In the given equation, p and q are positive constants. Which of the following is one of the solutions to the given equation?

A) $-\sqrt{q^2-p^2}$
B) $\sqrt{p^2+q^2}$
C) $\sqrt{q-p^2}$
D) $-p^2-q^2$

9

$$\sqrt{(x+6)(x-6)}=8$$

What is the positive solution to the given equation?

10

10

$$2u=\frac{18}{v}-6$$

The given equation relates the numbers u and v, where $u>0$ and $v>0$. Which equation correctly expresses v in terms of u ?

A) $v=\frac{9}{u+3}$
B) $v=\frac{u}{9}-3$
C) $v=\frac{u}{9}+3$
D) $v=\frac{u+3}{9}$

11

$$\frac{k}{3x+3y}=k+1$$

The given equation relates the distinct positive numbers x, y, and k. Which equation correctly expresses $x+y$ in terms of k ?

A) $x+y=\frac{k}{3k+1}$
B) $x+y=\frac{k}{3k+3}$
C) $x+y=\frac{3k}{k+1}$
D) $x+y=\frac{3k+3}{k}$

12

$$\left(\frac{1}{8}+\frac{1}{x}\right)t=1$$

The given equation represents the number of days t it will take Jim and Andy to paint a 300-foot fence working together given that it would take Jim x days to paint the fence working alone. If it takes 6 days for Jim and Andy to paint the fence working together, how many days would it have taken Jim to paint the fence working alone?

13

$$\frac{a}{b} = \frac{a+1}{2c}$$

The given equation relates the distinct positive numbers a, b, and c. Which equation correctly expresses a in terms of b and c ?

A) $a = \dfrac{b}{b-2c}$

B) $a = \dfrac{b}{2c-b}$

C) $a = \dfrac{b+c}{2c}$

D) $a = \dfrac{c-b}{2c}$

14

$$\frac{3r}{t} = 6\sqrt{2s}$$

The given equation relates the positive numbers r, s, and t. Which equation correctly expresses s in terms of r and t ?

A) $s = \dfrac{r^2}{2t^2}$

B) $s = \dfrac{r^2}{4t^2}$

C) $s = \dfrac{r^2}{8t^2}$

D) $s = \dfrac{3r^2}{4t^2}$

15

$$ax + 7a + x + 7 = b$$

In the given equation, a and b are positive constants. Which equation correctly expresses $x + 7$ in terms of a and b ?

A) $x + 7 = \dfrac{b}{a} - 7$

B) $x + 7 = \dfrac{b}{2a}$

C) $x + 7 = \dfrac{b}{a+1}$

D) $x + 7 = \dfrac{b-1}{a}$

16

If $(x+1)(x-2) = 7x - 18$, what is the value of $7x - 18$?

17

$$xy - 1 = z - xz$$

The given equation relates the positive numbers x, y, and z. Which equation correctly expresses x in terms of y and z ?

A) $\dfrac{z}{y} + 1$

B) $\dfrac{z}{y+z} + 1$

C) $\dfrac{z+1}{yz}$

D) $\dfrac{z+1}{y+z}$

18

If $\dfrac{2\sqrt{x+4}}{3} = 6$ and $x > 0$, what is the value of x ?

19

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

20

$$\frac{x-n}{3} = x(x-n)$$

Which of the following are solutions to the given equation, where n is a positive constant greater than 1 ?

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

II. $\frac{n}{3}$

III. n

A) I and II only

B) I and III only

C) II and III only

D) I, II, and III

21

If $x + y = \sqrt{x^2 + y^2 + 16}$, what is the value of xy ?

22

$$\sqrt{x+9} = \frac{x}{2} - 3$$

What is the solution to the given equation?

23

$$\sqrt{2(x-k)} = x - k$$

In the given equation, k is a constant. Which of the following is the sum of the solutions to the given equation?

A) $2k$

B) $k+1$

C) $2k-2$

D) $2k+2$

24

$$\frac{x}{\sqrt{x+b}} = 7 - \frac{b}{\sqrt{x+b}}$$

In the given equation, b is a positive constant. Which of the following is the solution to the given equation?

A) $7-b$

B) $49-b$

C) $b-49$

D) b^2+49

25

If $\sqrt{x+2} = 2 - \sqrt{x}$, what is the value of $2 - \sqrt{x}$?

A) $\frac{1}{2}$

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

C) $\sqrt{\frac{5}{2}}$

D) 2