Practice Test

Linear Equations

1

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

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

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

C) $\frac{24}{25}$

D) $\frac{25}{24}$

2

When one half of the number n is decreased by 4, the result is -6. What is three times n added to 7?

A) -7

B) -5

C) -3

D) -1

3

If $4-7x$ is 5 less than 23, what is the value of $3x$?

A) -12

B) -9

C) -6

D) -3

4

$$P = F(\frac{1}{2}v^2 + 1)$$

The above equation gives pressure P, which is exerted by a fluid that is forced to stop moving. The pressure depends on the initial force, F, and the speed of the fluid, v. Which of the following expresses the square of the velocity in terms of the pressure and the force?

A) $v^2 = 2(P-F)-1$

B) $v^2 = 2(P-F-1)$

C) $v^2 = 2(\frac{P}{F})-1$

D) $v^2 = 2(\frac{P-F}{F})$

5

One half of the number n increased by 10 is the same as four less than twice the number.

Which of the following equations represents the statement above?

A) $\frac{1}{2}(n+10) = 2(n-4)$

B) $\frac{1}{2}n+10 = 2(n-4)$

C) $\frac{1}{2}n+10 = 2n-4$

D) $\frac{1}{2}(n+10) = 2n-4$

6

If a is b less than one-half of c, what is b in terms of a and c?

A) $\frac{1}{2}c - a$

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

C) $2a - c$

D) $c - 2a$

7

If $x = 1 - y$ and $3x = 8 - 5y$, what is the value of x?

A) -2

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

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

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

8

The quotient of a number and five equals nine less than one half of the number. What is the number?

A) -20

B) -10

C) 20

D) 30

9

If $\frac{a}{b} = 1$, what is the value of $a - b$?

10

When an object is thrown from the ground into the air with an initial upward speed of v_0 meters per second, the speed v, in meters per second, is given by the equation $v = v_0 - 9.8t$, where t is the time in seconds. The speed of an object becomes 0 when the object reaches its maximum height. If an object is thrown upward with an initial speed of 14 m/sec, how many seconds does it taken an to reach its maximum height? (Round your answer to the nearest hundredth of a second.)

11

When an object is dropped from a height of s feet above the ground, the height h of the object is given by the equation $h = -16t^2 + s$, where t is the time in seconds after the object has dropped. If an object is dropped from a height of 144 feet above the ground, how many seconds will it take to hit the ground?

Answers

Linear Equations

Chapter 2 Practice Test

1. C

$\frac{5}{6}x = \frac{4}{5}$

$\frac{6}{5}\cdot\frac{5}{6}x = \frac{6}{5}\cdot\frac{4}{5}$ Multiply each side by $\frac{6}{5}$.

$x = \frac{24}{25}$

2. B

$\underbrace{\frac{1}{2}n}_{\frac{1}{2}\text{ of a number } n} \quad \underbrace{-4}_{\text{decreased by 4}} = \underbrace{-6}_{\text{negative 6}}$

$\frac{1}{2}n - 4 + 4 = -6 + 4$ Add 4 to each side.

$\frac{1}{2}n = -2$ Simplify.

$2\cdot\frac{1}{2}n = 2\cdot -2$ Multiply each side by 2.

$n = -4$ Simplify.

Three times n added to 7 is $3n + 7$.

$3n + 7$

$= 3(-4) + 7$ Substitute -4 for n.

$= -5$

3. C

$\underbrace{4 - 7x = 23 - 5}_{4-7x \text{ is 5 less than 23}}$

$4 - 7x = 18 \Rightarrow -7x = 14 \Rightarrow x = -2$

$3x = 3(-2) = -6$

4. D

$P = F(\frac{1}{2}v^2 + 1)$

$\frac{P}{F} = \frac{F}{F}(\frac{1}{2}v^2 + 1)$ Divide each side by F.

$\frac{P}{F} = \frac{1}{2}v^2 + 1$ Simplify.

$\frac{P}{F} - 1 = \frac{1}{2}v^2 + 1 - 1$ Subtract 1 from each side.

$\frac{P}{F} - 1 = \frac{1}{2}v^2$ Simplify.

$2(\frac{P}{F} - 1) = 2\cdot\frac{1}{2}v^2$ Multiply each side by 2.

$2(\frac{P}{F} - 1) = v^2$ Simplify.

$2(\frac{P}{F} - \frac{F}{F}) = v^2$ $\frac{F}{F} = 1$

$2(\frac{P - F}{F}) = v^2$ The common denominator is F.

Combine the numerators.

5. C

$\underbrace{\frac{1}{2}n + 10}_{\frac{1}{2}\text{ of the number } n \text{ increased by 10}} = \underbrace{2n - 4}_{\text{four less than twice the number}}$

6. A

$\underbrace{a = \frac{1}{2}c - b}_{a \text{ is } b \text{ less than } \frac{1}{2} \text{ of } c}$

$a - \frac{1}{2}c = \frac{1}{2}c - b - \frac{1}{2}c$ Add $-\frac{1}{2}c$ to each side.

$a - \frac{1}{2}c = -b$ Simplify.

$(-1)[a - \frac{1}{2}c] = (-1)(-b)$ Multiply each side by -1.

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

Answers
Linear Equations

7. B

$x = 1 - y$	First equation
$3x = 8 - 5y$	Second equation

Solving the first equation for y yields $y = 1 - x$. Substitute $1 - x$ for y in the second equation.

$3x = 8 - 5(1 - x)$	Substitution
$3x = 8 - 5 + 5x$	Distributive property
$3x = 3 + 5x$	Simplify.
$3x - 5x = 3 + 5x - 5x$	Subtract $5x$ from each side.
$-2x = 3$	Simplify.
$\frac{-2x}{-2} = \frac{3}{-2}$	Divide each side by -2.
$x = -\frac{3}{2}$	Simplify.

8. D

$$\underbrace{\frac{x}{5}}_{\text{the quotient of a number and 5}} = \underbrace{\frac{1}{2}x - 9}_{\text{nine less than one half of the number}}$$

$10(\frac{x}{5}) = 10(\frac{1}{2}x - 9)$	Multiply each side by 10.
$2x = 5x - 90$	Distributive Property
$2x - 5x = 5x - 90 - 5x$	Subtract $5x$ from each side.
$-3x = -90$	Simplify.
$\frac{-3x}{-3} = \frac{-90}{-3}$	Divide each side by -3.
$x = 30$	Simplify.

9. 0

$$\frac{a}{b} = 1$$

$b(\frac{a}{b}) = b(1)$	Multiply each side by b.
$a = b$	Simplify.
$a - b = b - b$	Subtract b from each side.
$a - b = 0$	Simplify.

10. 1.43

As the object moves upward, its speed decreases continuously and becomes 0 as it reaches its maximum height.

$v = v_0 - 9.8t$ is the given equation. Substituting 14 for v_0 and 0 for v gives $0 = 14 - 9.8t$.

Solving the equation for t gives $t = \frac{14}{9.8} = 1.428$ seconds, which is 1.43 to the nearest hundredth of a second.

11. 3

When the object hits the ground, the height is 0. Substitute 0 for h and 144 for s in the equation $0 = -16t^2 + 144$. Solving the equation for t^2 gives $t^2 = \frac{144}{16} = 9$.

Therefore, $t = \sqrt{9} = 3$.