

Name Solution

Total Possible Points = 20 Points

Show all your work.

1. Let $g(x) = x^2 + 4x + 3$ and $f(x) = \frac{-1}{3}x + 10$

(3 points)

<p>a. Find x when $f(x) = 6$</p> $6 = \frac{-1}{3}x + 10$ $18 = -x + 30$ $\begin{array}{r} 18 \\ -30 \\ \hline -12 = -x \end{array}$ $x = 12$	<p>b. Find x when $g(x) = 0$</p> $x^2 + 4x + 3 = 0$ $(x+3)(x+1) = 0$ $x = -1 \quad x = -3$	<p>c. Find $g(a+1) =$</p> $(a+1)^2 + 4(a+1) + 3$ $= a^2 + 2a + 1 + 4a + 4 + 3$ $= a^2 + 6a + 8$
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2. For the linear function $-5x + 10y = 30$

SHOW work to find each of the following

(3 points)

a) The slope is $\frac{1}{2}$

$$10y = 5x + 30$$

$$y = \frac{5}{10}x + \frac{30}{10}$$

$$y = \frac{1}{2}x + 3$$

b) The y-intercept is $(0, 3)$

c) The x-intercept is $(-6, 0)$

3. The length of a rectangular room is 7 feet more than its width. If the perimeter of the room is 150 feet, find the width and length of the room.

(2 points)

(Hint: Perimeter of Rectangle = $2L + 2W$)

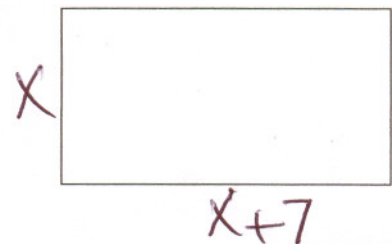
$$150 = 2x + 2(x+7)$$

$$2x + 2x + 14 = 150$$

$$4x = 136$$

width $\Rightarrow x = 34$ feet

length $\Rightarrow 41$ feet



4. Solve the following equations algebraically:

(4 points)

a. $\frac{6x}{-x+1} = -2$

$$2x - 2 = 6x$$

$$-2 = 4x$$

$$x = -\frac{1}{2}$$

b. $\frac{2x+1}{7} = \frac{5x-1}{2}$

$$4x + 2 = 35x - 7$$

$$9 = 31x$$

$$x = \frac{9}{31}$$

5. Solve the following algebraically:

<p>a) $x^2 - 16 = 0$</p> $(x+4)(x-4) = 0$ $x = 4$ $x = -4$	<p>b) $y^2 - 8y = -7$</p> $y^2 - 8y + 7 = 0$ $(y-7)(y-1) = 0$ $y = 7$ $y = 1$	<p>c) $4x^2 - 9 = 0$</p> $(2x+3)(2x-3) = 0$ $x = \frac{3}{2}$ $x = -\frac{3}{2}$	<p>$x^2 - 2x = 3$</p> $x^2 - 2x - 3 = 0$ $(x-3)(x+1) = 0$ $x = 3$ $x = -1$
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6. Perform the indicated operations. Simplify your answers.

(4 pts)

<p>a) $\left(\frac{x^3}{y^9}\right)^{\frac{2}{3}}$</p> $= \frac{(x^3)^{\frac{2}{3}}}{(y^9)^{\frac{2}{3}}} = \frac{x^2}{y^6}$	<p>b) $\sqrt{x} \cdot \sqrt[3]{x}$</p> $= x^{\frac{1}{2}} \cdot x^{\frac{1}{3}}$ $= x^{\frac{5}{6}}$
<p>c) $\sqrt[3]{x^{10}}$</p> $= \sqrt[3]{x^9} \sqrt[3]{x}$ $= x^3 \sqrt[3]{x}$	<p>d) $-2x^{-7}$</p> $= \frac{-2}{x^7}$