

Name Solution

Total Possible Points = 20 Points

Show all your work.

1. Let $g(x) = x^2 - 6x + 5$ and $f(x) = \frac{-1}{2}x + 20$

(3 points)

a. Find x when $f(x) = 6$

$$6 = -\frac{1}{2}x + 20 \quad \boxed{X = +28}$$

b. Find x when $g(x) = 0$

$$x^2 - 6x + 5 = 0$$

$$(x-5)(x-1) = 0$$

$$\boxed{X=5} \quad \boxed{X=1}$$

c. Find $g(a+1) = (a+1)^2 - 6(a+1) + 5$

$$= a^2 + 2a + 1 - 6a - 6 + 5$$

$$= \boxed{a^2 - 4a + 6 - 6 = a^2 - 4a}$$

2. For the linear function $-3x + 9y = 30$

SHOW work to find each of the following

$$9y = 3x + 30$$

(2 points)

$$y = \frac{3}{9}x + \frac{30}{9}$$

a) The slope is $\frac{1}{3}$

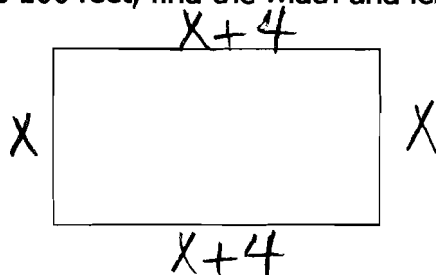
b) The y-intercept is $(0, \frac{30}{9})$

$$y = \frac{1}{3}x + \frac{30}{9}$$

c) The x-intercept is $(-10, 0)$

3. The length of a rectangular room is 4 feet more than its width. If the perimeter of the room is 100 feet, find the width and length of the room.

(3 points)



$$X = \frac{92}{4} = 23$$

$$\boxed{\text{Width} = 23 \text{ feet}} \\ \boxed{\text{length} = 27 \text{ feet}}$$

$$2X + 2(X+4) = 100$$

$$2X + 2X + 8 = 100$$

$$4X = 92$$

4. Solve the following equations:

(4 points)

a. $\frac{2x}{x+1} = \frac{3}{7}$

$$3x+3 = 2x$$

$$x+3 = 0$$

$$x = -3$$

b. $\frac{3x+1}{7} = \frac{2x-1}{2}$

$$2(3x+1) = 7(2x-1)$$

$$6x+2 = 14x-7$$

$$-8x = -9$$

$$x = \frac{9}{8}$$

5. Solve the following:

(4 Points)

| | | | |
|---|--|--|---|
| <p>a) $x^2 - 81 = 0$</p> $(x+9)(x-9) = 0$ $x = -9$ $x = 9$ | <p>b) $y^2 - 6y = 7$</p> $y^2 - 6y - 7 = 0$ $(y-7)(y+1) = 0$ $y = 7$ $y = -1$ | <p>c) $9x^2 - 64 = 0$</p> $(3x+8)(3x-8) = 0$ $x = \frac{8}{3}$ $x = -\frac{8}{3}$ | <p>$x^2 - 3x = 40$</p> $x^2 - 3x - 40 = 0$ $(x-8)(x+5) = 0$ $x = 8$ $x = -5$ |
|---|--|--|---|

6. Perform the indicated operations. Simplify your answers.

(4 pts)

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

Name Solution

Total Possible Points = 20 Points

Show all your work.

1. Let $g(x) = x^2 - x - 6$ and $f(x) = \frac{-1}{3}x + 10$

(3 points)

| | | |
|--|---|---|
| <p>a. Find x when $f(x) = 6$</p> $6 = \frac{-1}{3}x + 10$ $\begin{array}{r} 6 \\ -10 \\ \hline -4 \end{array} = \frac{-1}{3}x$ $12 = x$ | <p>b. Find x when $g(x) = 0$</p> $x^2 - x - 6 = 0$ $(x-3)(x+2) = 0$ $x = 3 \quad x = -2$ | <p>c. Find $g(a+1)$</p> $= (a+1)^2 - (a+1) - 6$ $= a^2 + 2a + 1 - a - 1 - 6$ $= a^2 + a - 6$ |
|--|---|---|

2. Solve the following:

(4 Points)

| | | | |
|---|--|---|---|
| <p>a) $x^2 - 81 = 0$</p> $(x+9)(x-9) = 0$ $x = 9 \quad x = -9$ | <p>b) $y^2 - 6y = 7$</p> $y^2 - 6y - 7 = 0$ $(y-7)(y+1) = 0$ $y = 7 \quad y = -1$ | <p>c) $9x^2 - 64 = 0$</p> $(3x+8)(3x-8) = 0$ $x = \pm \frac{8}{3}$ | <p>$x^2 - 3x = 40$</p> $x^2 - 3x - 40 = 0$ $(x-8)(x+5) = 0$ $x = 8$ $x = -5$ |
|---|--|---|---|

3) For the linear function $-5x + 5y = 30$

SHOW work to find each of the following

(2 points)

a) The slope is 1

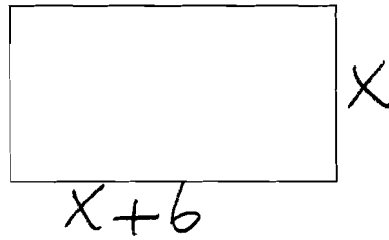
$$5y = 5x + 30$$

$$y = x + 6$$

b) The y-intercept is (0,6)

The x-intercept is (-6,0)

4. The length of a rectangular room is 6 feet more than its width. If the perimeter of the room is 200 feet, find the width and length of the room. (3 points)



$$X + X + 6 + X + X + 6 = 200$$

$$4X + 12 = 200$$

$$4X = 188$$

$$X = 47 \text{ feet}$$

Width = 47 feet
length = 53 feet

5. Perform the indicated operations. Simplify your answers. (4 pts)

a) $\left(\frac{x^2}{y^6}\right)^{\frac{3}{2}} = \frac{x^3}{y^9}$

b) $\sqrt{x} \cdot \sqrt[3]{x} = x^{\frac{1}{2}} x^{\frac{1}{3}}$
 $= x^{\frac{1}{2} + \frac{1}{3}} = \sqrt[6]{x^5}$

c) $\sqrt[3]{x^7}$
 $= x^{\frac{7}{3}} \text{ or } x^2 \sqrt[3]{x}$

d) $-5x^{-3}$
 $= \frac{-5}{x^3}$

6. Solve the following equations: (4 points)

a. $\frac{2x}{x+4} = 4$

$$4x + 16 = 2x$$

$$2x = -16$$

$$X = -8$$

b. $\frac{3x-1}{7} = \frac{2x+3}{2}$

$$6x - 2 = 14x + 21$$

$$-8x = 23$$

$$X = -\frac{23}{8}$$