

5. Find the range of the function  $f(x) = -x^2 + 4x$  if the domain is  $\{-2, 0, 1\}$

$$-(-2)^2 + 4(-2) = -4 + -8 = -12$$

$$-(0)^2 + 4(0) = 0$$

$$-(1)^2 + 4 = -1 + 4 = 3$$

$$R = \{-12, 0, 3\}$$

6. Find the range of the function  $f(x) = \frac{1}{3}x - 5$ , if the domain is  $\{-3, 0, 6\}$

$$\frac{1}{3}(-3) - 5 = -1 - 5 = -6$$

$$\frac{1}{3}(0) - 5 = -5$$

$$\frac{1}{3}(6) - 5 = 2 - 5 = -3$$

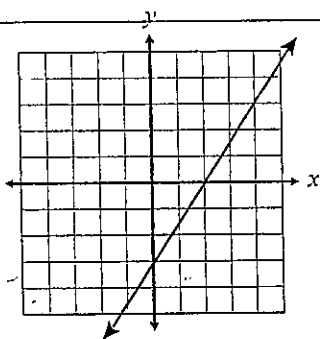
$$R = \{-6, -5, -3\}$$

### Zeros of Functions

The zeros of a function are where it passes through the X-axis.

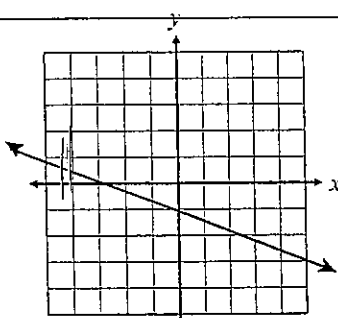
To find zeros, set the equation equal to 0, and solve!

1.



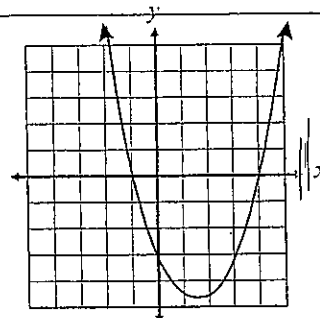
$$x = 2$$

2.



$$x = -3$$

3.



$$x = \{-1, 4\}$$

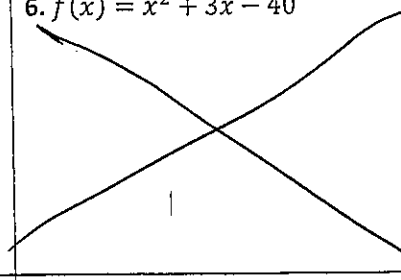
4.  $f(x) = 2x + 2$

$$\begin{aligned} 0 &= 2x + 2 \\ -2 & \quad -2 \\ \hline 2 &= 2x \\ \frac{2}{2} &= \frac{2x}{2} \\ x &= -1 \end{aligned}$$

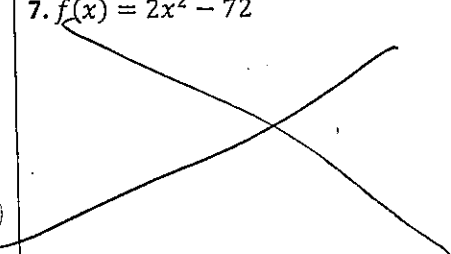
5.  $f(x) = \frac{2}{5}x - 4$

$$\begin{aligned} 0 &= \frac{2}{5}x - 4 \\ +4 & \quad +4 \\ \hline 5 &= \frac{2}{5}x \\ \frac{5}{2} \cdot 5 &= \frac{2}{5}x \cdot \frac{5}{2} \\ x &= 10 \end{aligned}$$

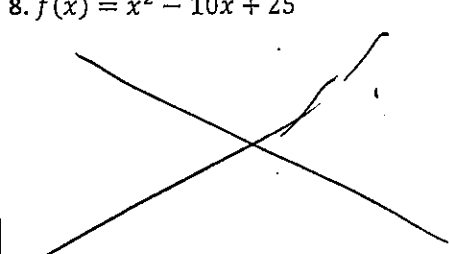
6.  $f(x) = x^2 + 3x - 40$



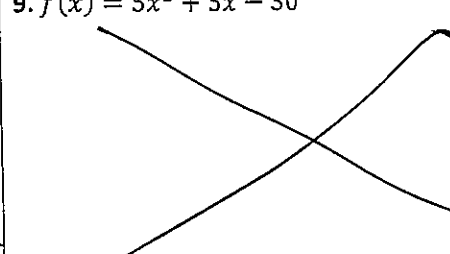
7.  $f(x) = 2x^2 - 72$



8.  $f(x) = x^2 - 10x + 25$



9.  $f(x) = 5x^2 + 5x - 30$



# Standard Form

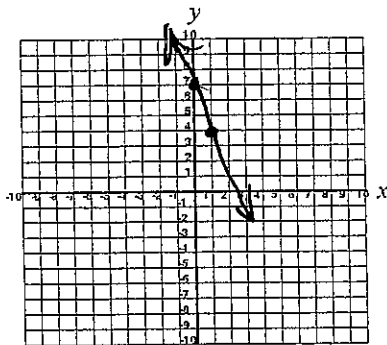
Standard Form: $Ax + By = C$	
<p>1. <math>x - y = 3</math></p> $\begin{array}{r} x - y = 3 \\ -x \quad -x \\ \hline -y = -x + 3 \\ \frac{-y}{-1} = \frac{-x + 3}{-1} \\ y = x - 3 \end{array}$ <p>x-intercept = <u>3</u></p> <p>y-intercept = <u>-3</u></p> <p>Slope-Intercept Form: <u><math>y = x - 3</math></u></p>	<p>2. <math>2x + 5y = 20</math></p> $\begin{array}{r} 2x + 5y = 20 \\ -2x \quad -2x \\ \hline 5y = -2x + 20 \\ \frac{5y}{5} = \frac{-2x + 20}{5} \\ y = -\frac{2}{5}x + 4 \end{array}$ <p>x-intercept = <u>10</u></p> <p>y-intercept = <u>4</u></p> <p>Slope-Intercept Form: <u><math>y = -\frac{2}{5}x + 4</math></u></p>
<p>3. <math>4x + y = 8</math></p> $\begin{array}{r} 4x + y = 8 \\ -4x \quad -4x \\ \hline y = -4x + 8 \end{array}$ <p>x-intercept = <u>2</u></p> <p>y-intercept = <u>8</u></p> <p>Slope-Intercept Form: <u><math>y = -4x + 8</math></u></p>	<p>4. <math>x - 3y = 6</math></p> $\begin{array}{r} x - 3y = 6 \\ -x \quad -x \\ \hline -3y = -x + 6 \\ \frac{-3y}{-3} = \frac{-x + 6}{-3} \\ y = \frac{1}{3}x - 2 \end{array}$ <p>x-intercept = <u>6</u></p> <p>y-intercept = <u>-2</u></p> <p>Slope-Intercept Form: <u><math>y = \frac{1}{3}x - 2</math></u></p>

## Graphing Linear Equations

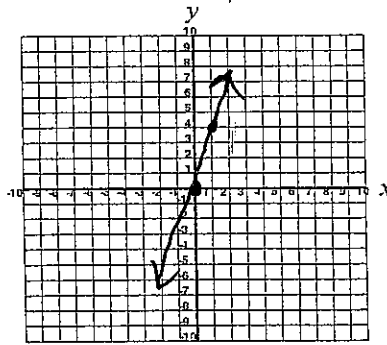
(Always use  $y = mx + b$  form!)

$$\begin{array}{l} -2y = -3x - 6 \\ \frac{-2y}{-2} = \frac{-3x - 6}{-2} \\ y = \frac{3}{2}x + 3 \end{array}$$

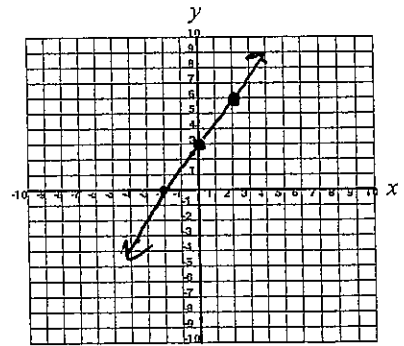
1.  $y = -3x + 7$



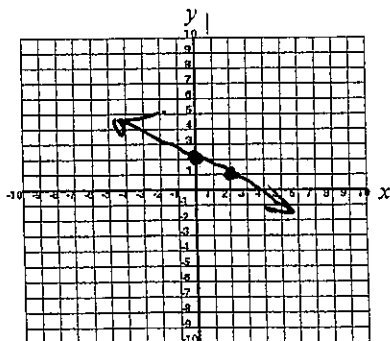
2.  $y = 4x$



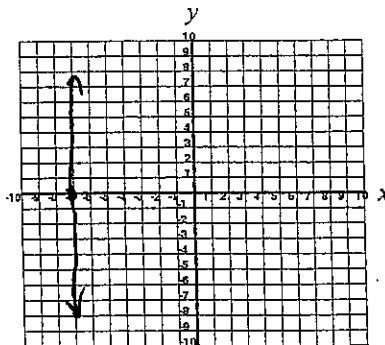
3.  $3x - 2y = -6$



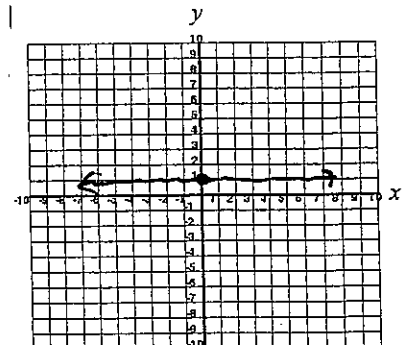
4.  $x + 2y = 4$



5.  $x = -7$



6.  $y = 1$



$$\begin{array}{r} x + 2y = 4 \\ -x \quad -x \\ \hline 2y = -x + 4 \\ \frac{2y}{2} = \frac{-x + 4}{2} \\ y = -\frac{1}{2}x + 2 \end{array}$$

Name: \_\_\_\_\_

Algebra Review: **PACKET #5**

## Exponent Rules

PRODUCT RULE	POWER RULE	QUOTIENT RULE	NEGATIVE EXPONENT RULE
$x^a \cdot x^b = x^{a+b}$	$(x^a)^b = x^{ab}$	$\frac{x^a}{x^b} = x^{a-b}$	$x^{-a} = \frac{1}{x^a}$
1. $v^4 \cdot 7v^3 \cdot 5v$ $35v^8$	2. $(3x^2y^2)^3$ $3^3 x^6 y^6$ $27x^6 y^6$	3. $(-2a^6bc^3)^2 \cdot -5ab^2$ $-2^2 a^{12} b^2 c^6 \cdot -5ab^2$ $4a^{12} b^2 c^6 \cdot -5ab^2$ $-20a^{13} b^4 c^6$	
4. $(-2y^4) \cdot (xy^3)^2 - 13x^2y^{10}$ $-2y^4 \cdot x^2y^6 - 13x^2y^{10}$ $-2x^2y^{10} - 13x^2y^{10}$ $-15x^2y^{10}$	5. $\frac{a^6b^7c^2}{a^5b^4c^2}$ $ab^3$	6. $\frac{(-3x^6)^2}{5x^3 \cdot 3x^3} \cdot (-3^2 x^{12}) = \frac{9x^{12}}{15x^6} = \frac{3x^6}{5}$	
7. $\left(\frac{4x^4y^2}{6xy}\right)^2 \cdot \frac{4^2 x^8 y^4}{6^2 x^2 y^2} = \frac{16x^8 y^4}{36x^2 y^2}$ $= \frac{4x^6 y^2}{9}$	8. $\frac{-9n^8}{27n^{10}}$ $-\frac{1}{3n^2}$	9. $\frac{a^{12}b^{-3}}{(ab)^{-4}} = \frac{a^{12}b^{-3}}{a^{-4}b^{-4}} = a^{16}b$	

## Simplifying Polynomials

1. $(5 + 2x^3 + x - 3x^2) + (4x^3 + 11 - 6x + 7x^2)$	2. $(2x^2 + 3x + 2) - (x^2 - 4x - 1)$	3. $3a^2b^3(2a^2 - 7ab + b^2)$
4. $(x + 4)(x + 9)$	5. $(2a + 5b)(a - 3b)$	6. $(x + 8)(x - 8)$
7. $(2y - 1)^2$	8. $\frac{18a^3b + 12a^2b^2 - 6ab}{6ab}$	9. $\frac{-24x^4 + 48x^3 - 8x^2}{8x^3}$

# Monomial Square Roots

<p>1. <math>\sqrt{x^2}</math></p> <p>= X</p>	<p>2. <math>\sqrt{9k^4}</math></p> <p><math>3k^2</math></p>	<p>3. <math>\sqrt{y^5}</math></p> <p><math>\sqrt{y^4} \sqrt{y}</math> <math>y^2 \sqrt{y}</math></p>
<p>4. <math>\sqrt{18m^3}</math></p> <p><math>\sqrt{9} \sqrt{2} \sqrt{m^2} \sqrt{m}</math></p> <p><math>3m \sqrt{2m}</math></p>	<p>5. <math>\sqrt{36x}</math></p> <p><math>6\sqrt{x}</math></p>	<p>6. <math>\sqrt{28ab^2}</math></p> <p><math>\sqrt{4} \sqrt{7} \sqrt{a} \sqrt{b^2}</math></p> <p><math>2b \sqrt{7a}</math></p>
<p>7. <math>\sqrt{81x^2y^2z}</math></p> <p><math>9xy\sqrt{z}</math></p>	<p>8. <math>\sqrt{108a^2b^3c^6}</math></p> <p><math>\sqrt{64} \sqrt{2} \sqrt{a^2} \sqrt{b^2} \sqrt{b} \sqrt{c^6}</math></p> <p><math>8abc^3 \sqrt{2b}</math></p>	<p>9. <math>\sqrt{72mn^8p^5}</math></p> <p><math>\sqrt{36} \sqrt{2} \sqrt{m} \sqrt{n^8} \sqrt{p^4} \sqrt{p}</math></p> <p><math>6n^4p^2 \sqrt{2mp}</math></p>