Simplifying Algebraic Fractions

Simplify each fraction.

1) $\frac{21x^3y^2}{49x^2y^3} = \frac{3 \cdot 7 \cdot x \cdot x \cdot x \cdot y \cdot y}{7 \cdot 7 \cdot x \cdot x \cdot y \cdot y \cdot y} = \boxed{\frac{3x}{7y}}$

2) $\frac{b}{b^4} = \frac{b}{b \cdot b \cdot b \cdot b} = \boxed{\frac{1}{b^3}}$

3) $\frac{10m^2}{20m} = \frac{2 \cdot 5 \cdot m \cdot m}{2 \cdot 2 \cdot 5 \cdot m} = \boxed{\frac{m}{2}}$

Multiplying and Dividing Monomials

Find each product or quotient. Express using exponents.

1) $4y \cdot 3y^3 = 4 \cdot y \cdot 3 \cdot y \cdot y \cdot y = \boxed{12y^4}$

2) $n^5 \cdot n^4 = n^{5+4} = \boxed{n^9}$

3) $m^7 \div m^4 = \dfrac{m \cdot m \cdot m \cdot m \cdot m \cdot m \cdot m}{m \cdot m \cdot m \cdot m} = \boxed{m^3}$

4) $m^7 \div m^4 = m^{7-4} = \boxed{m^3}$

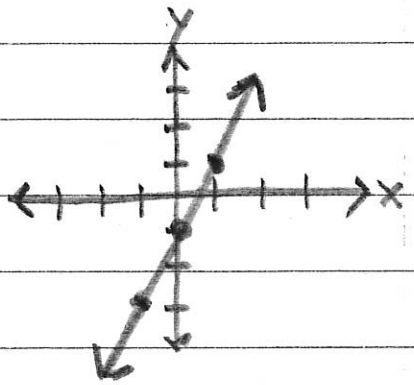
5) $\left(\dfrac{a^5}{a^3}\right)\left(\dfrac{b^7}{b^{10}}\right) = \dfrac{a^{5-3}}{b^{10-7}} = \boxed{\dfrac{a^2}{b^3}}$

Linear Equations in Two Variables

Graph each equation by plotting ordered pairs.

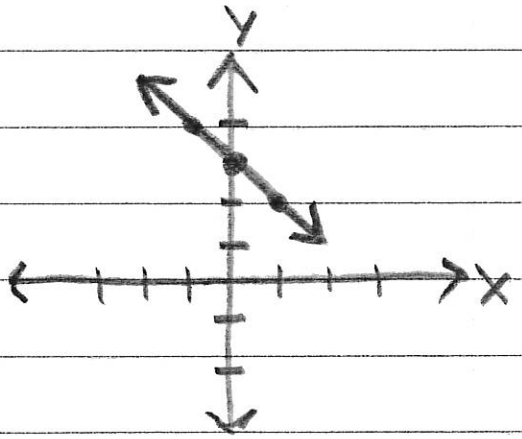
1) $y = 2x - 1$

x	$2x-1$	y	
-1	$2(-1)-1$	-3	$(-1,-3)$
0	$2(0)-1$	-1	$(0,-1)$
1	$2(1)-1$	1	$(1,1)$



2) $y = -x + 3$

x	$-x+3$	y	
-1	$-(-1)+3$	4	$(-1,4)$
0	$0+3$	3	$(0,3)$
1	$-1+3$	2	$(1,2)$



Graphing Linear Equations Using Intercepts

X-intercept: let $y=0$, solve for x
y-intercept: let $x=0$, solve for y

Graph $y=-3x+3$ using the x-intercept and y-intercept.

$y=-3x+3$ (let $y=0$)

$0=-3x+3$

$-3 \quad -3$

$\frac{-3}{-3} = \frac{-3x}{-3}$

$1=x$ (1,0) ← x-intercept

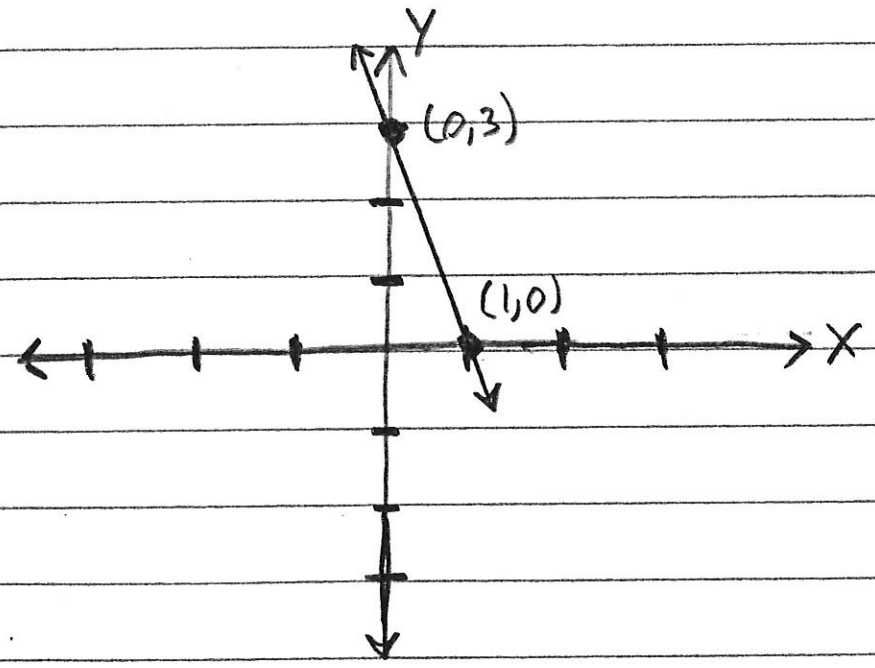
$y=-3x+3$ (let $x=0$)

$y=-3\cdot 0+3$

$y=0+3$

$y=3$ ← y-intercept

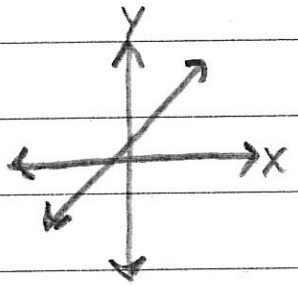
(0,3)



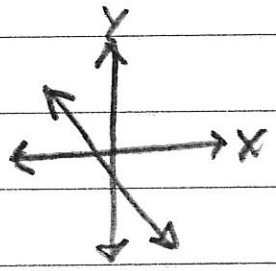
Slope

$$\text{Slope} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\text{rise}}{\text{run}}$$

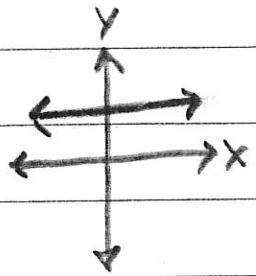
Positive Slope



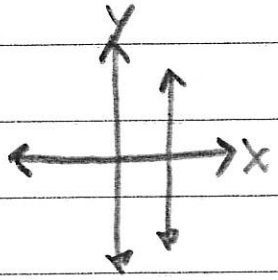
Negative Slope



Zero Slope



Undefined Slope



Find the slope of the line that passes through each pair of points.

1) $(3,4)$ and $(0,2)$

$$m = \frac{\Delta y}{\Delta x} = \frac{4-2}{3-0} = \boxed{\frac{2}{3}}$$

2) $(-4,6)$ and $(-1,-3)$

$$m = \frac{\Delta y}{\Delta x} = \frac{6-(-3)}{-4-(-1)} = \frac{9}{-3} = \boxed{-3}$$

Slope-Intercept Form

$y = mx + b$

m: Slope

b: y-Intercept

State the slope and the y-intercept.

1) $y = \frac{2}{3}x - 4$

$m = \frac{2}{3}$

$b = -4$

2) $4x + 3y = -9$

$-4x \quad -4x$

$\frac{3y}{3} = \frac{-4x - 9}{3}$

$y = -\frac{4}{3}x - 3$

$m = -\frac{4}{3}$

$b = -3$

3) Graph $y = -\frac{1}{3}x + 2$ using the slope and y-intercept.

$m = -\frac{1}{3}$

$b = 2$