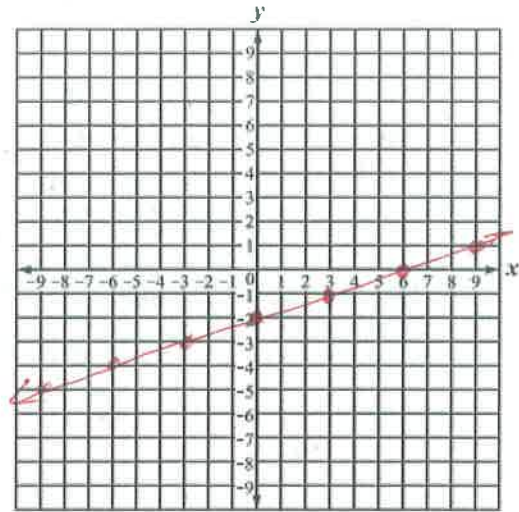


Math 011 Exam 3 Study Guide

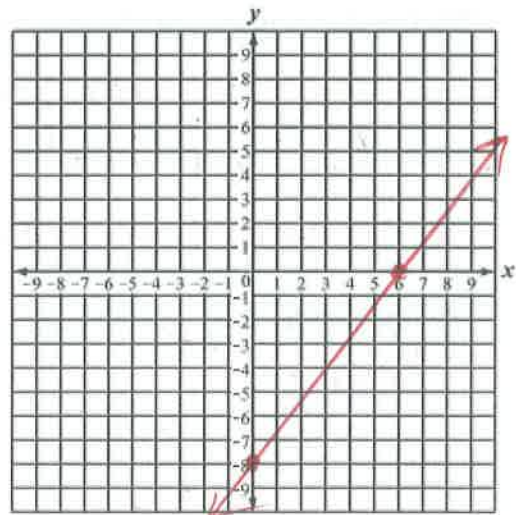
- #1 Sketch a graph of the equation $y = \frac{1}{3}x - 2$

y-int: $(0, -2)$
Slope: $\frac{1}{3}$ 1 up
3 Right



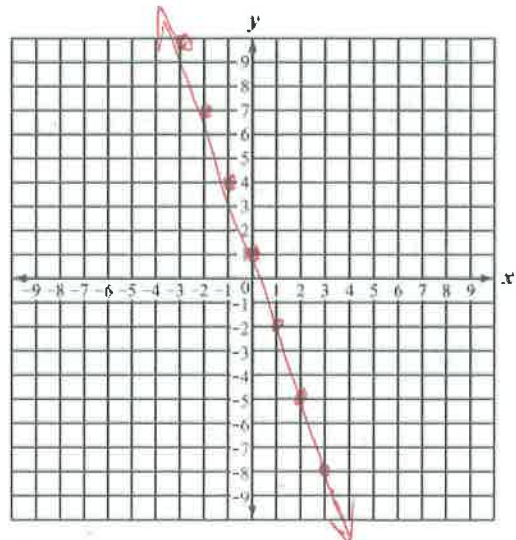
- #2 Sketch a graph of the equation $4x - 3y = 24$

Set $x = 0$
 $-3y = 24$ $(0, -8)$
 $y = -8$
Set $y = 0$
 $4x = 24$ $(6, 0)$
 $x = 6$



- #3 Sketch a graph of the equation $y = -3x + 1$

y-int: $(0, 1)$
Slope: $-\frac{3}{1}$ 3 Down
1 Right



Write the equations for the lines described below. For extra practice, sketch a graph of each line.

- #4 The line with a slope of -4 that passes through (2, 2)

$$(y-2) = -4(x-2)$$

$$y-2 = -4x + 8$$

$$\boxed{y = -4x + 10}$$

- #5 The line that passes through (0, 2) and (-2, 2)

Same y-coordinate

$$\text{Slope} = 0$$

$$\boxed{y = 2}$$

- #6 The line that is perpendicular to $y = 2$ and passes through (4, 5)

$y = 2$ is horizontal

Any vertical line

is perpendicular

$$x = a$$

$$\boxed{x = 4}$$

- #7 The line parallel to $4y - 3x = 12$ and passing through the point (4, 0).

Rewrite 1st

$$4y = 3x + 12$$

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

To be parallel, we
use the same slope

$$(y-0) = \frac{3}{4}(x-4) \Rightarrow \boxed{y = \frac{3}{4}x - 3}$$

- #8 The line perpendicular to $4y - 3x = 12$ and passing through the origin.

To be perpendicular
we need opposite
reciprocal slopes

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

$$(0,0)$$

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

$$(y-0) = \frac{-4}{3}(x-0)$$

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

- #9 The line passing through the points (3, -2) and (1, 6).

Find slope 1st

$$m = \frac{6 - (-2)}{1 - 3} = \frac{8}{-2} = -4$$

$$(y-6) = -4(x-1)$$

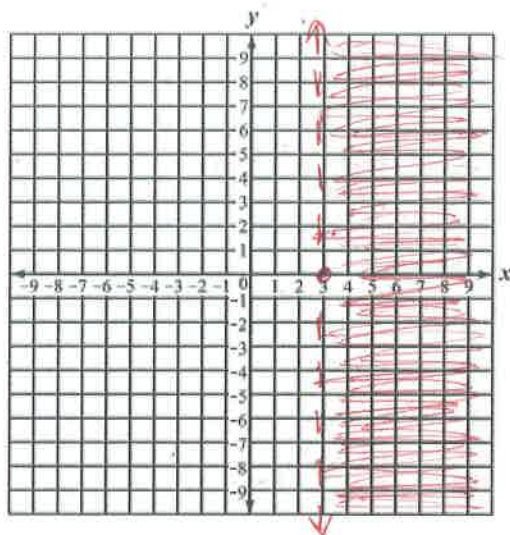
$$y-6 = -4x + 4$$

$$\boxed{y = -4x + 10}$$

Sketch a graph of the linear inequalities given below.

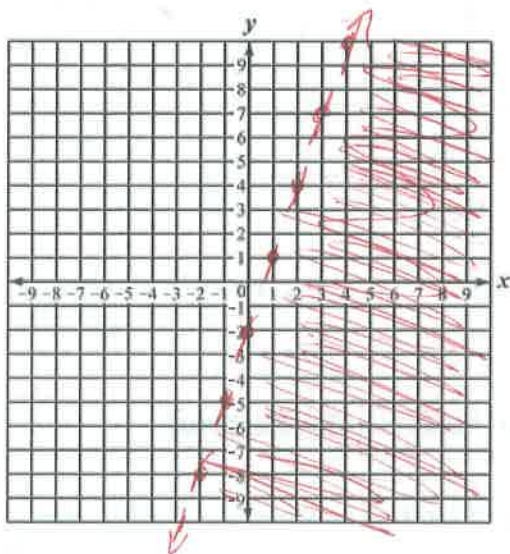
#10 $x > 3$

Vertical dotted
line through $(3,0)$
Test $(0,0)$
 $0 > 3$ X
Shade other side



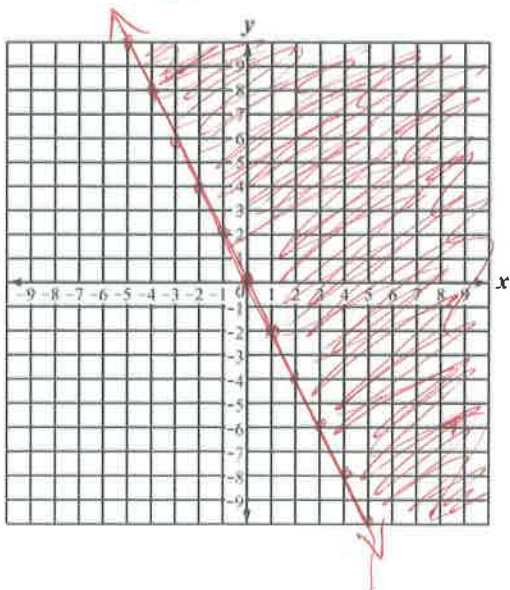
#11 $y < 3x - 2$

Dotted line
y-int: $(0, -2)$
 $m = \frac{3}{1}$ 3 Up
1 Right
Test $(0,0)$
 $0 < 3(0) - 2$ X
Shade other side



#12 $y \geq -2x$

Solid line
y-int: $(0,0)$
 $m = \frac{-2}{1}$ 2 Down
1 Right
Test $(0,1)$
 $(1) \geq -2(0)$ ✓
Shade that side



Evaluate the following exponential expressions.

#13 $x^6 \cdot x^3$

$$x^{6+3} = \boxed{x^9}$$

#14 $(y^3)^6$

$$y^{3 \cdot 6} = \boxed{y^{18}}$$

#15 $x^8 \div x^7$

$$x^{8-7} = \boxed{x^1}$$

#16 $(-3)^3$

$$(-3)(-3)(-3) = (9)(-3) = \boxed{-27}$$

#17 6^{-2}

$$\left(\frac{6}{1}\right)^{-2} = \left(\frac{1}{6}\right)^2 = \frac{1}{6^2} = \boxed{\frac{1}{36}}$$

#18 $(-8)^0$

$$\boxed{1}$$

Useful Formulas and Equations

Slope of the line between two points: $m = \frac{y_2 - y_1}{x_2 - x_1}$

Slope-Intercept form of a linear equation: $y = mx + b$

Point-Slope Equation of a line: $(y - y_1) = m(x - x_1)$

Equation of a vertical line: $x = a$

Equation of a horizontal line: $y = b$