

SECTION 2.1: REVIEW OF LINES

- Slope of a line between two points, $m = \frac{y_2 - y_1}{x_2 - x_1}$
- Equations of a Line,
 - Point-Slope Form: $y - y_1 = m(x - x_1)$
 - Slope-Intercept Form: $y = mx + b$
 - Standard Form: $Ax + BY = C$
 - Vertical Line: $x = a$
 - Horizontal Line: $y = b$
- Intercepts of a Line
 - x -intercept: $(x, 0)$
 - y -intercept: $(0, y)$
- Interpreting Change, $m = \frac{\Delta y}{\Delta x}$

Pr 1. Determine the slope between each of the given pair of points.

(a) $(2, -5)$ and $(-9, 11)$

(b) $(2.5, 1.3)$ and $(2.5, -2.8)$

(c) $\left(\frac{2}{2}, \frac{2}{5}\right)$ and $\left(-\frac{7}{11}, \frac{2}{5}\right)$

Pr 2. Write the equation of the line given the slope which passes through the given point in the stated form.

(a) $m = \frac{2}{7}$ and $(-9, 11)$, in point-slope form

(b) $m = -\frac{5}{2}$ and $(4, -7)$, in slope-intercept form

(c) $m = \frac{6}{7}$ and $\left(\frac{7}{2}, 0\right)$, in standard form

(d) $m = 0$ and $(17, 20)$, in standard form

Pr 3. Write the equation of the line which passes through the given pair of points.

(a) $(2, -5)$ and $(-9, 11)$

(b) $(7, 10)$ and $(7, -12)$

(c) intersects the y -axis at $y = 7$ and the x -axis at $x = -6$

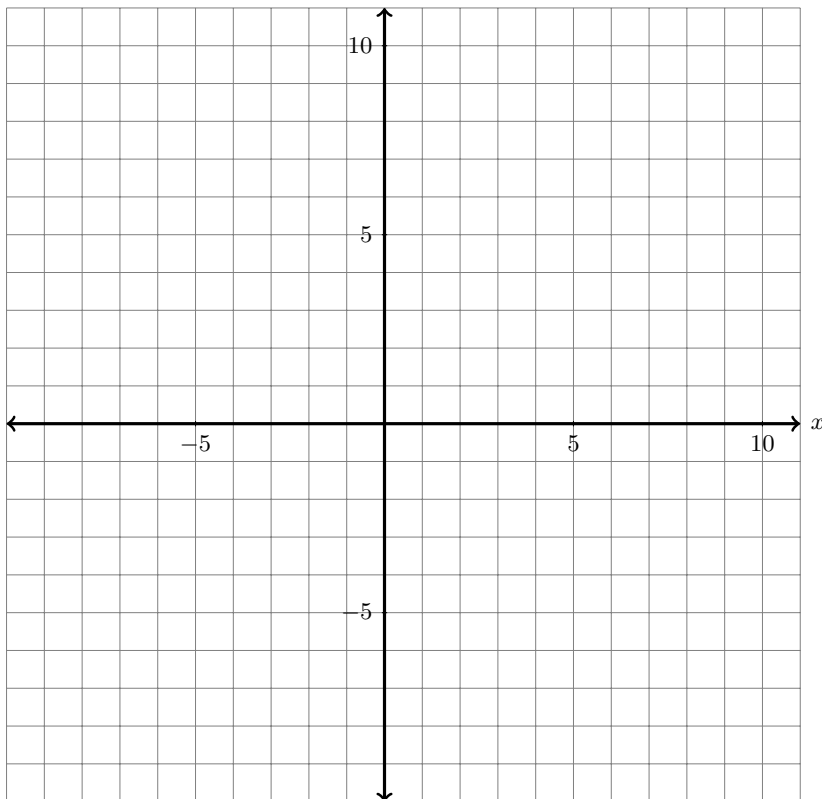
Pr 4. Determine the x - and y -intercept without graphing. Write the coordinates of each intercept. Then use the points to graph each line.

(a) $5x - 6y = 30$

(b) $\frac{2}{3}y = -\frac{2}{3}x + 12$

(c) $x = -4$

(d) $y = 7$



Pr 5. Given the line $x = \frac{2}{3}y - \frac{11}{4}$,

(a) If x increases by 2 units, what is the corresponding change in y ?

(b) If y decreases by 9 units, what is the corresponding change in x ?

(c) If x decreases by 7 units, what is the corresponding change in y ?

Pr 6. Suppose that when x increases by 2.1 units, y decreases by 4.5 units, what is the slope of the line containing any point (x, y) ?

SECTION 2.2: MODELING WITH LINEAR FUNCTIONS

- Linear Depreciation, $V(t) = mt + b$
- Cost, variable cost + fixed costs $C(x) = mx + F$
- Revenue, price per item times quantity sold $R(x) = px$
- Profit, revenue minus cost $P(x) = R(x) - C(x)$

- Pr 1.** A piece of machinery is purchased new for \$225,000 and has a value of \$165,000 after 5 years.
- (a) Assuming the value of the machinery depreciates at a constant rate each year, determine the rate of depreciation.

(b) Write the linear depreciation model for the value of the machinery, V , after t years.

(c) What is the value of the machinery after 47 months?

(d) If the machinery reaches scrap value in 15 years, what is the scrap value of the machinery?

Pr 2. An item purchased 6 years ago has a current value of \$2000. After a little research you find the item reaches its scrap value of \$800 after 107 months. Assuming the item is depreciating linearly, what was the purchase price of the item?

Pr 3. Ted runs a food truck that sells gyros. The cost of maintaining the food truck is \$255 per week. The stand makes a profit of \$124 when 50 gyros are sold in a week. If only 20 gyros are sold, Ted knows the total cost for that week is \$234.

(a) Write the cost function for producing x gyros at Munckin's stand.

(b) Write the profit function for producing and selling x gyros.

(c) Write the revenue function for the sale of x gyros at Ted's food truck.