



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. 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 2. Write the equation of the line that passes through the given pair of points, in the stated form.

(a) $(2, -5)$ and $(-9, 11)$ in point-slope form

(b) $(7, 10)$ and $(7, -12)$ in slope-intercept form

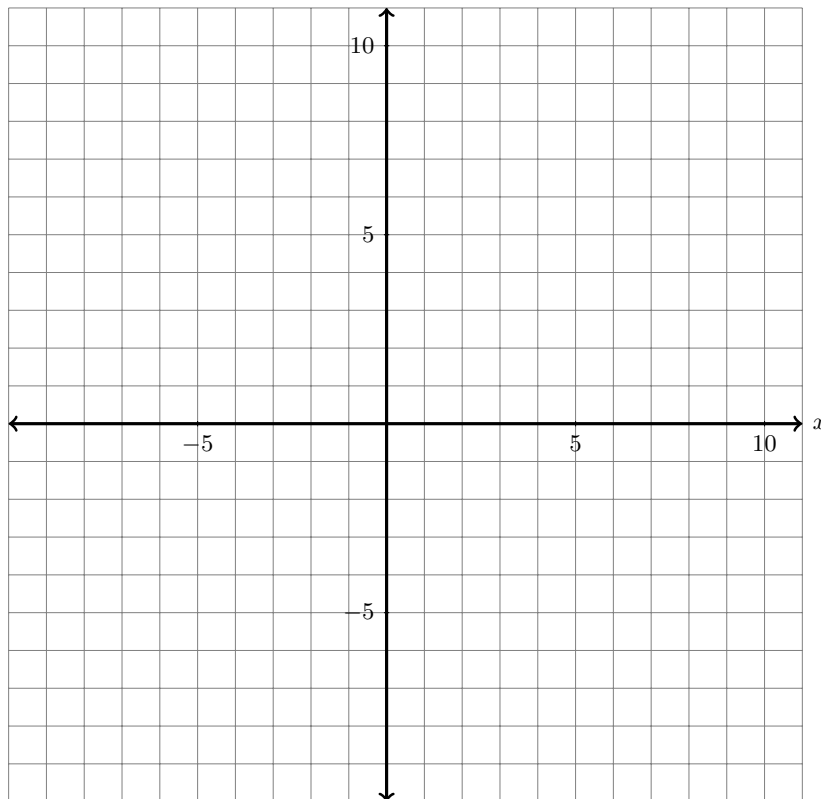
(c) $\left(\frac{2}{5}, \frac{2}{3}\right)$ and $\left(\frac{2}{5}, -\frac{7}{11}\right)$ in standard form

(d) intersects the y -axis at $y = 7$ and the x -axis at $x = -6$ in standard form

Pr 3. Determine the slope, and the x - and y -intercepts without graphing. Write the coordinates of each intercept. Then use the points to graph each line.

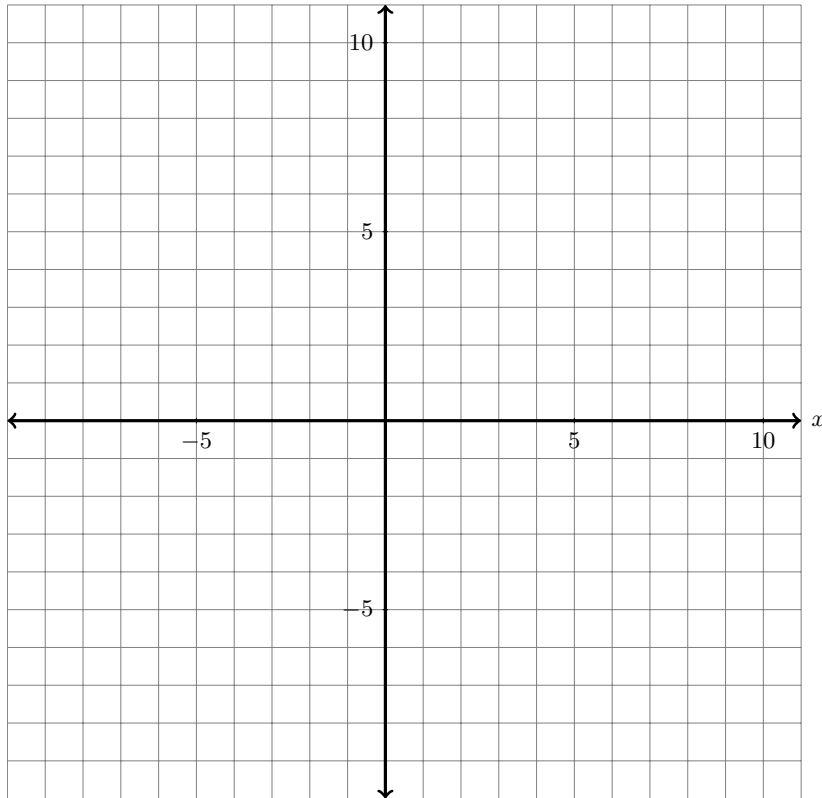
(a) $5x - 6y = 30$

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



(c) $x = -4$

(d) $y = 7$



Pr 4. (a) Given the line $3x - 2y = -8$, if x increases by 3 units, what is the corresponding change in y ?

(b) Given the line $y = \frac{1}{2}x + 4$, if x decreases by 7 units, what is the corresponding change in y ?

(c) Given the line $y = 3(x + 2) - 5$, If y decreases by 9 units, what is the corresponding change in x ?

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 $P(x) = R(x) - C(x)$
- Demand, $D(x) = p(x) = mx + b$
- Supply, $S(x) = p(x) = mx + b$

Pr 1. A piece of machinery is purchased. After 15 months, it has a value of of \$225,000 and that same machinery 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 initial value of the machinery?

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

Pr 2. 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 \$145 when 50 gyros are sold in a week. If only 20 gyros are sold, Ted knows the total cost for that week is \$295.

(a) Write the cost function for producing x gyros at Ted's food truck.

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

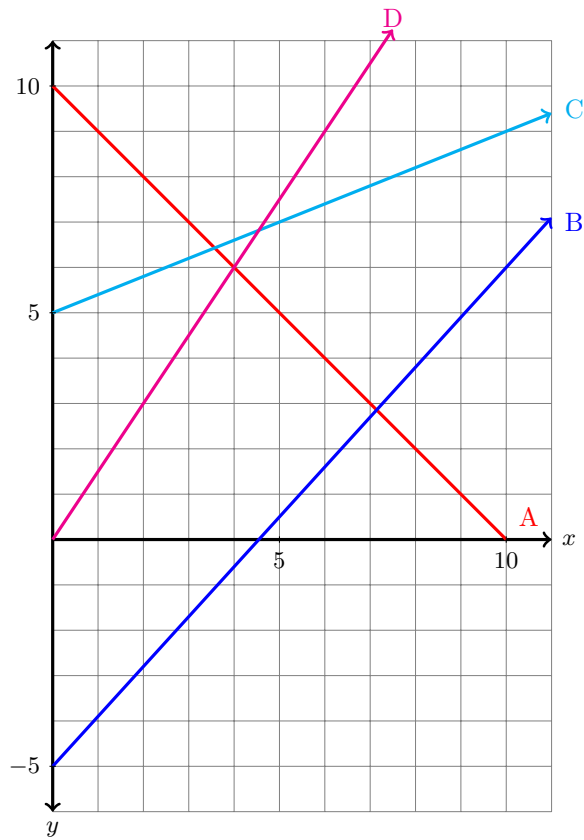
(c) Write the profit function for producing and selling x gyros.

Pr 3. Mimitando is a video game company that decides to make a new console, and GameStomp decides to carry it. Mimitando will supply 300 thousand consoles to GameStomp if the sales price of the console is \$200. If the sales price increases by \$50, then Mimitando will supply 25 thousand more consoles. Consumers will not buy the console at all if the price is \$400, but will buy 600 thousand consoles if the price is \$250.

(a) Write the demand function for consumers demanding x thousand consoles at a price of p dollars.

(b) Write the supply function for Mimitando to provide x thousand consoles when the sales price of the console is p dollars.

Pr 4. Which of the following lines graphed below could be the graphs of a supply, demand, cost, revenue, or profit function? Explain your answer.



- (a) Lines that could be graphs of Cost functions:
- (b) Lines that could be graphs of Revenue functions:
- (c) Lines that could be graphs of Profit functions:
- (d) Lines that could be graphs of demand functions:
- (e) Lines that could be graphs of supply functions: