

C: Graphing Linear Equations

Remember the equation of a line is:

$$y = mx + b$$

$$m = \frac{(y_2 - y_1)}{(x_2 - x_1)} = \frac{\text{rise}}{\text{run}}$$

$b = y$ -intercept
* always
where $y = 0$.

Examples:

1. a) Create a graph and determine a linear equation for the given chart.

x	-3	-2	-1	0	1	2	3
y	-10	-6	-2	2	6	10	14

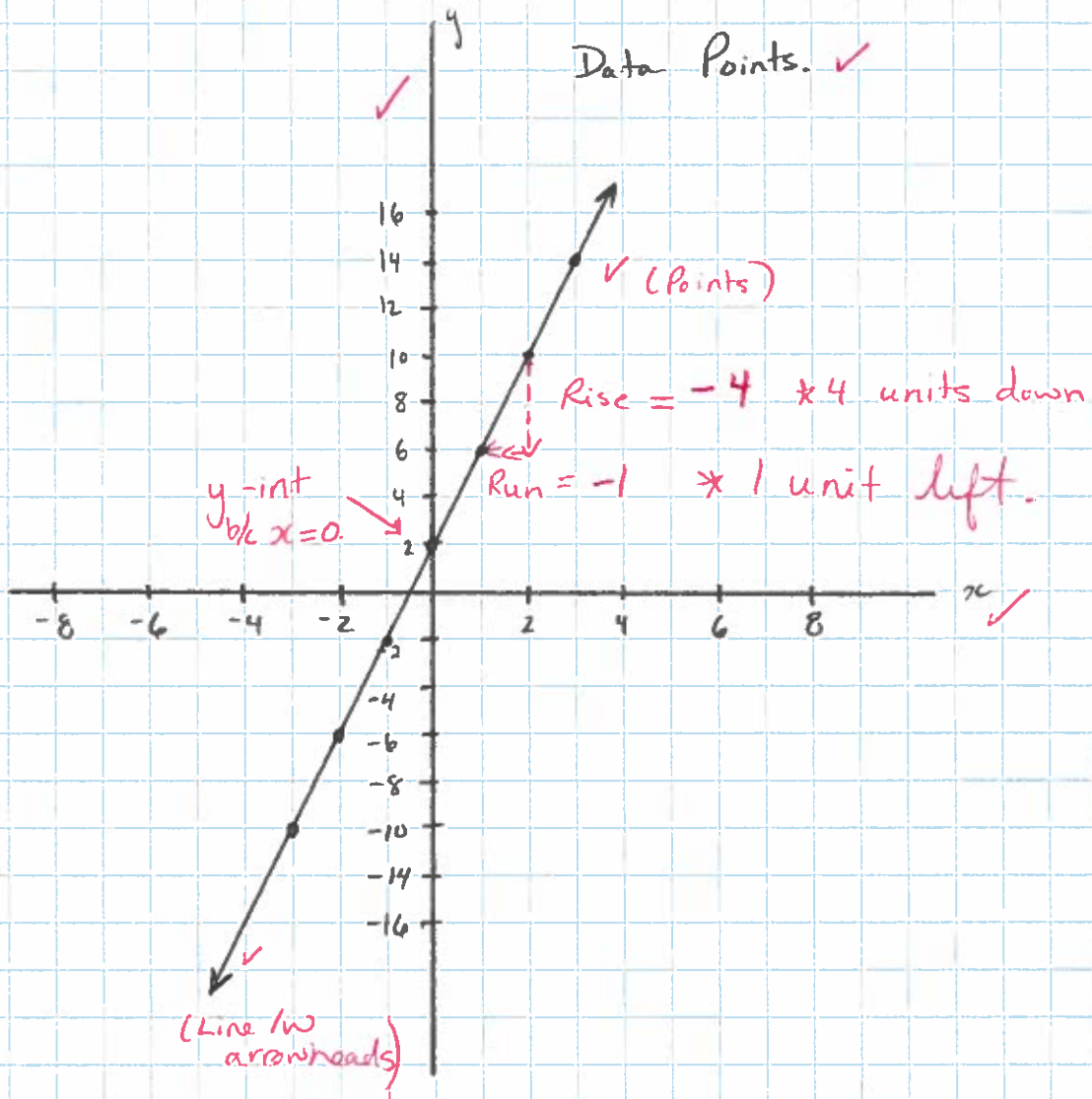
* Graph 1st because m and b can be found using the graph.

Graph must include:

1. Horizontal axis /w labels.
2. Vertical axis /w labels.
3. Title
4. Correct points (x, y)
5. Connected /w straight line /w arrowheads.

* Graph is Given on next page.

1. a)



Equation

$$y = mx + b$$

b - when $x=0$ (get from graph)

Coordinate Point for $x=0$

(0, 2)

↳ y-point is b.

$$y = mx + 2$$

$$\begin{aligned} m = \text{slope} &= \frac{\text{rise}}{\text{run}} && \text{(get from graph)} \\ &= \frac{-4}{-1} \\ &= 4 \end{aligned}$$

$$y = mx + 2$$

$$\boxed{y = 4x + 2}$$

1. b) What will "y" be when $x = 10$.

$$y = 4x + 2 \quad (\text{from a})$$

$$\begin{aligned} y &= 4(10) + 2 \\ &= 40 + 2 \\ &= 42 \end{aligned}$$

c) What will "x" be when $y = -20$

$$y = 4x + 2 \quad (\text{from a})$$

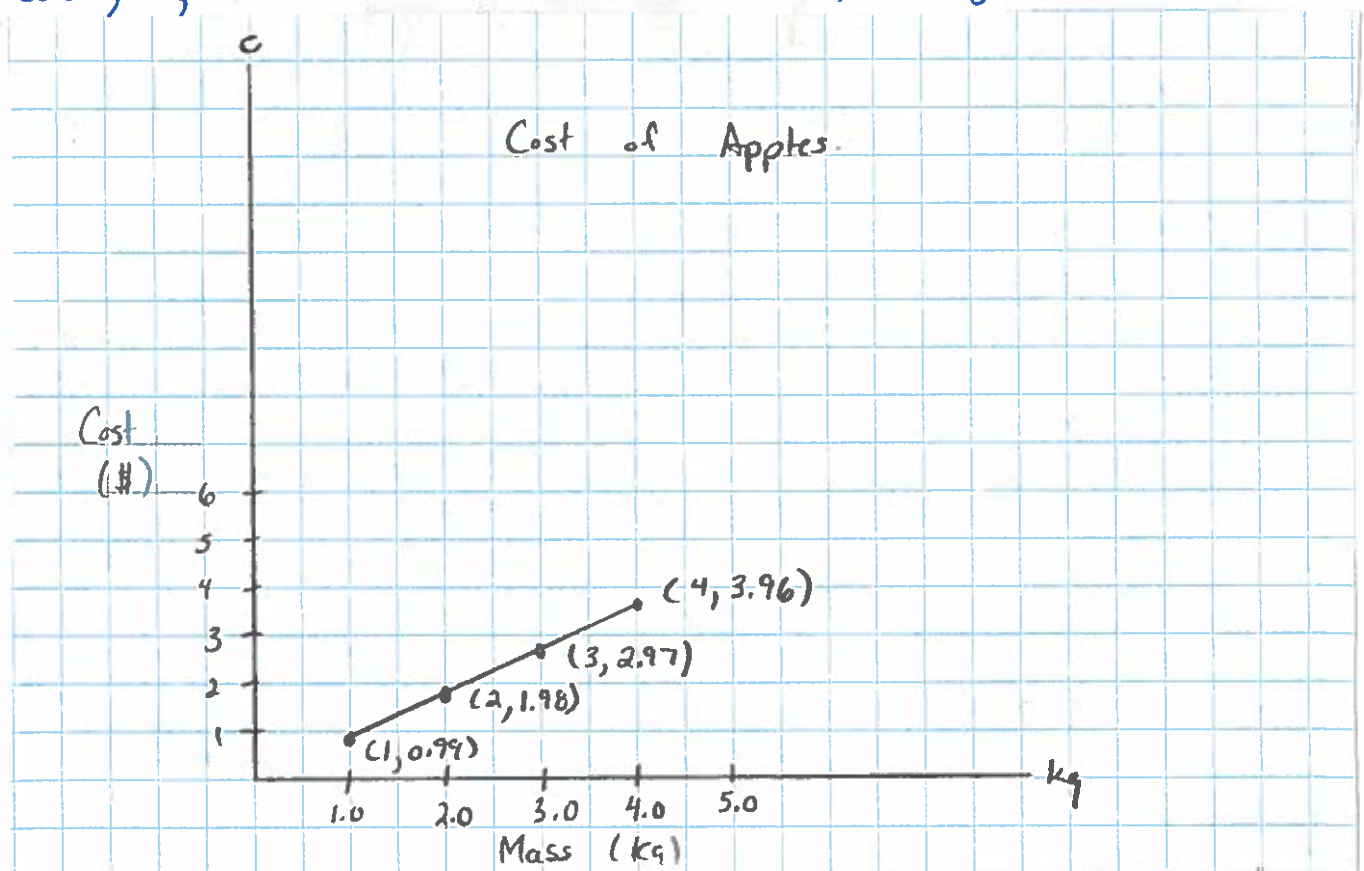
$$-20 = 4x + 2$$

$$\begin{array}{r} -20 = 4x + 2 \\ -2 \quad \quad -2 \end{array}$$

$$\frac{-22}{4} = \frac{4x}{4}$$

$$\boxed{-5.5 = x}$$

2. The graph below shows the relationship between the cost, C , in dollars and the mass, m , in kg of apples.



a) What is the linear equation?

Use the provided graph, (provided points)

* Because data points are decimals use the traditional formulae work.

$$y = mx + b$$

$$m = \frac{(y_2 - y_1)}{(x_2 - x_1)} \quad * \text{ I am using } (4, 3.96) \text{ \& } (1, 0.99)$$

$$\frac{(3.96 - 0.99)}{(4 - 1)}$$

$$= \frac{2.97}{3}$$

$$= 0.99$$

$$y = 0.99x + b \quad * \text{ To find } b \text{ I am going to use } (2, 1.98)$$

$$1.98 = 0.99(2) + b$$

$$1.98 = 1.98 + b$$

$$-1.98 \quad -1.98$$

$$0 = b$$

$$y = 0.99x + b$$

$$\boxed{y = 0.99x + 0} \quad \text{---or---} \quad \boxed{y = 0.99x}$$

b) What mass of apples would \$5.94 buy you?

y - cost
x - kg

$$y = 0.99x \quad (\text{from a})$$
$$\frac{\$5.94}{0.99} = \frac{0.99x}{0.99}$$

$$\boxed{6 \text{ Kg} = x}$$

c) Is it appropriate to interpolate and extrapolate this graph?

It is appropriate to interpolate and extrapolate. You cannot extrapolate beyond the point (0,0).