Direct Variation:

1. Suppose y varies directly as x and y = 51 when x = 3.
    a. Write a direct variation equation that relates x and y.

$$k = \frac{y}{x} = \frac{51}{3} = 17$$

$$\boxed{y = 17x}$$

    b. Find the value of x when y = 63

$$\frac{63}{17} = \frac{17x}{17}$$

$$x \approx 3.7$$

2. The distance a jet travels varies directly as the number of hours it flies. A jet traveled 3420 miles in 6 hours.
    a. Write the direct variation equation:

$$k = \frac{3420}{6} = 570$$

$$\boxed{y = 570x}$$

    b. How long will it take to fly 6500 miles.

$$\frac{6500}{570} = \frac{570x}{570}$$

$$\boxed{x = 11.4 \text{ hours}}$$

    c. How far will it go in 24 hours?

$$y = 570(24)$$

$$\boxed{y = 13680 \text{ miles}}$$

Find 5 consecutive integers such that their sum is 820.
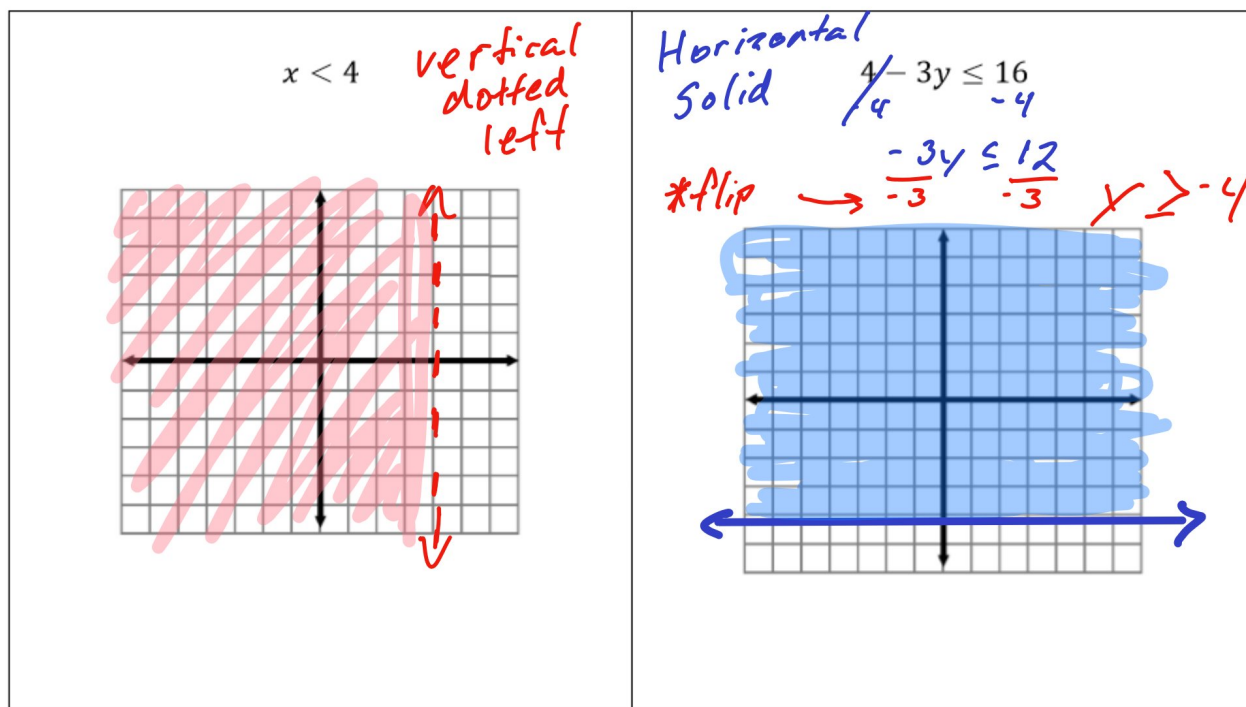
$$x + (x+1) + (x+2) + (x+3) + (x+4) = 820$$

$$5x + 10 = 820$$

$$5x = 810$$

$$x = 162$$

$$\boxed{162, 163, 164, 165, 166}$$

Graph:

$x < 4$ *vertical dotted left*

Horizontal Solid $4 - 3y \le 16$
$_{4}$ $_{-4}$

flip → $\dfrac{-3y}{-3} \le \dfrac{12}{-3}$ $y \ge -4$

Find the inverse of $f(x) = -\frac{1}{3}x + 2.$ Graph both $f(x)$ and $f^{-1}(x).$
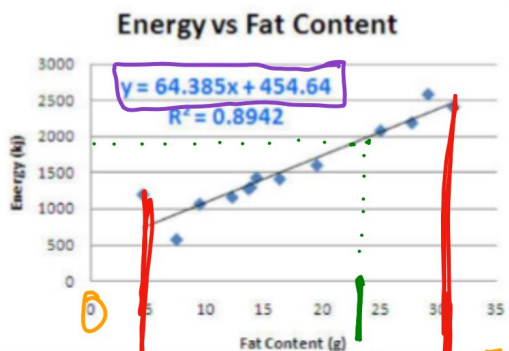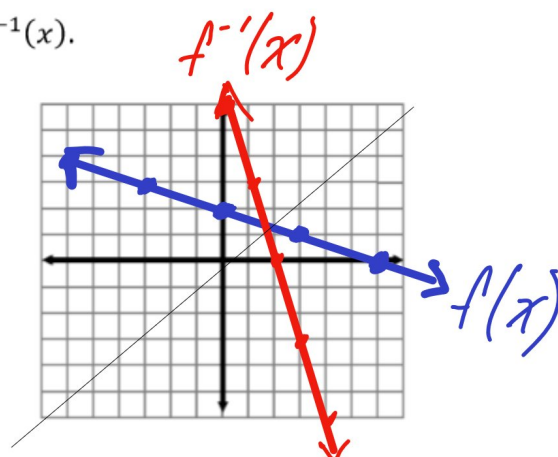
$f^{-1}(x)$

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

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

$\left[x - 2 = -\frac{1}{3}y \right] \times -3$

$-3(x - 2) = y \longrightarrow f^{-1}(x) = -3x + 6$

$f^{-1}(x)$

$f(x)$

Energy vs Fat Content

$y = 64.385x + 454.64$
$R^2 = 0.8942$

Energy (kj)

Fat Content (g)

EX   interpolation   23   EX

a) Find the energy content of an item with a fat content of 23g. Is this interpolation or extrapolation?

$y = 64.385(23) + 454.64$

$= \boxed{1935.5}$

b) Find the energy content of an item with a fat content of 0g. Is this interpolation or extrapolation?

$y = 64.385(0) + 454.64$

$= \boxed{454.64}$