

# Homework

## Linear Inequalities with Context

# 1-3

Solve the system of inequalities.

$$2x + 3y > -9$$

$$-x + y \leq 4$$

$$y > -\frac{2}{3}x - 3$$

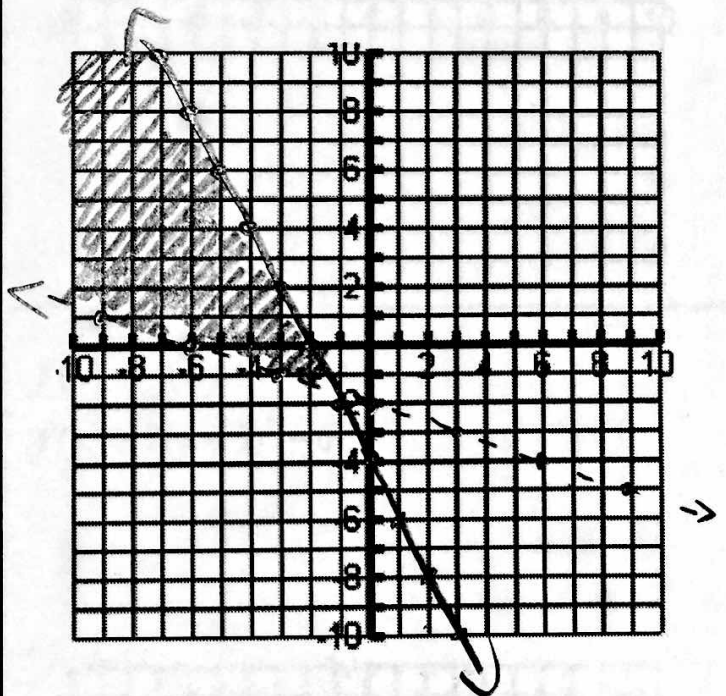
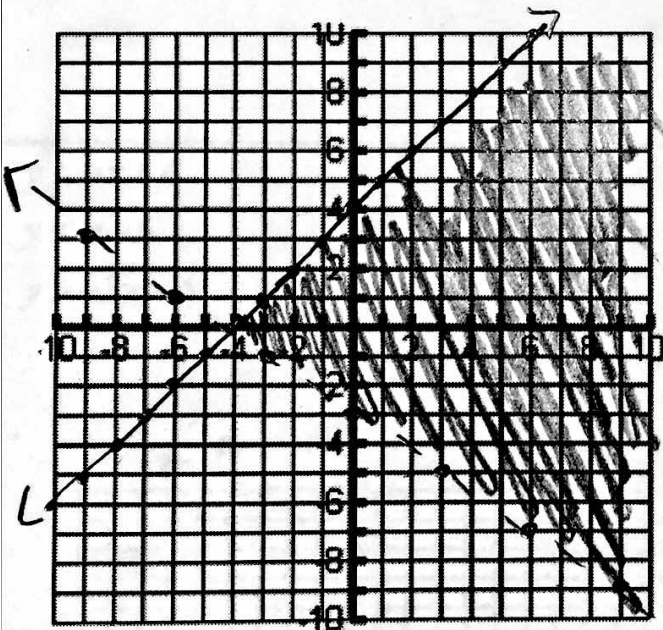
$$y \leq x + 4$$

$$4x + 2y \leq -8$$

$$-x - 3y < 6$$

$$y \leq -2x - 4$$

$$y > -\frac{1}{3}x - 2$$



$$f(x) > 2x^2 - 6x - 7$$

$$4x + f(x) \leq 10$$

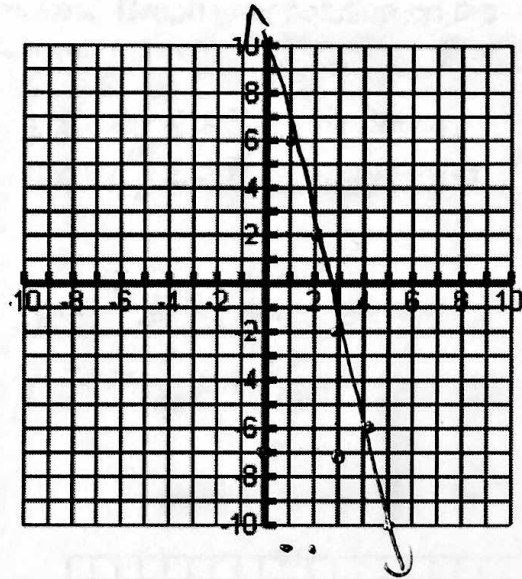
$$f(x) > 2x^2 - 6x - 7$$

$$f(x) \leq -4x + 10$$

$$x = \frac{-(-6)}{2(2)} = \frac{6}{4} = \frac{3}{2}$$

$$x = \frac{6 \pm \sqrt{36 - 4(2)(-7)}}{4}$$

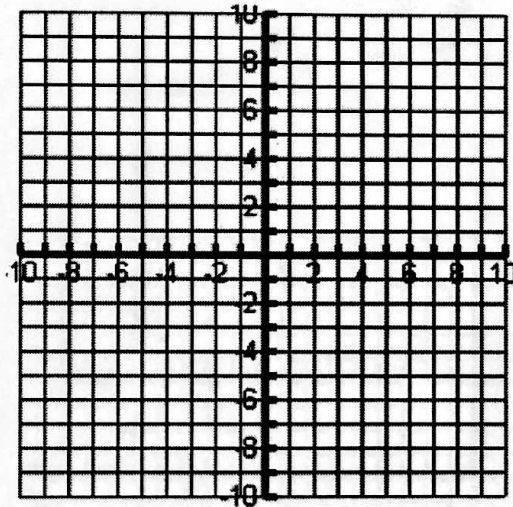
$$x = \frac{6 \pm \sqrt{92}}{4} = \frac{6 \pm 2\sqrt{23}}{4} = \frac{3 \pm \sqrt{23}}{2}$$



$$-(x-2)^2 + 7 \leq y$$

$$-2x + 2y < -6$$

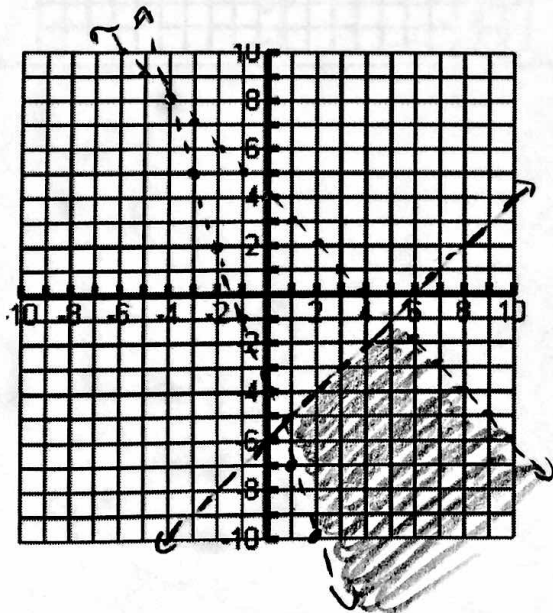
**\*\*Try to graph the quadratic function without a calculator.\*\***



$$y < -x + 4$$

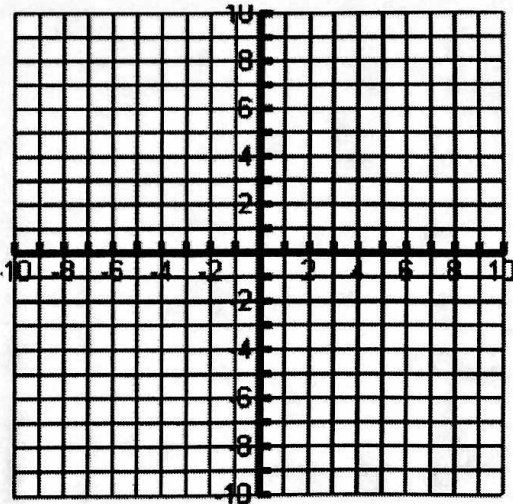
$$y < x - 6$$

$$y > -3x - 4$$



$$f(x) \leq -(x+3)^2 + 8$$

$$f(x) \geq 2(x+3)^2 - 6$$

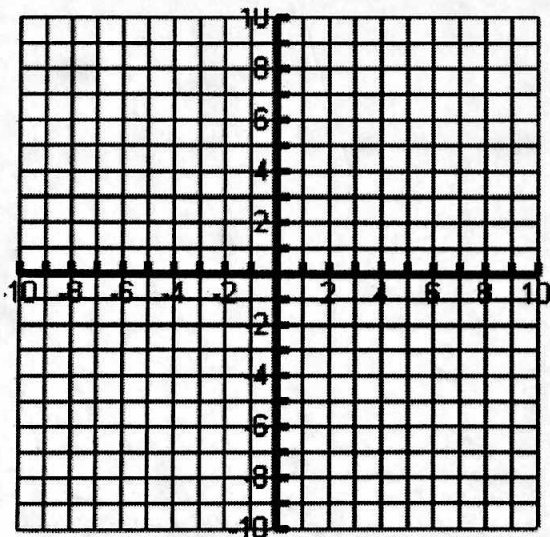


A sundae requires 3 ice-cream scoops and 4 strawberries, and a milkshake requires 2 ice-cream scoops and 6 strawberries. Ramses wants to make sundaes and milkshakes with at most 25 ice-cream scoops and 37 strawberries. Let's form a system of inequalities to represent his conditions. Let  $x$  denote the number of sundaes he makes and  $y$  the number of milkshakes he makes. Graph your solution on the following graph.

$$\begin{aligned} 3x + 2y &\leq 25 && \text{ice-cream} \\ 4x + 6y &\leq 37 && \text{strawberries} \end{aligned}$$

$$y \leq -\frac{3}{2}x + \frac{25}{2}$$

$$y \leq -\frac{4}{6}x + \frac{37}{4}$$



For a person of height  $h$  (in inches), a healthy weight  $W$  (in pounds) is one that satisfies this system of inequalities:

$$w \geq \frac{19h^2}{703}$$

$$w \leq \frac{25h^2}{703}$$

Graph the system for  $0 \leq h \leq 80$  using your graphing calculator. What is the range of healthy weights for a person 67 inches tall?

