

Complete all problems on a separate sheet of paper. The answer key is posted on my webpage!

1. Find the solution(s) of the following systems using algebra:

a) $\{6x - 2y = -4, y = 3x + 2$

d) $\{4x^2 + y^2 = 13, x^2 + y^2 = 10$

b) $\{x + y = -2, y = 4x - 7$

e) $\{y = x^2 + 4x + 5, y = x^2 + 2x - 1$

c) $\{5x + y = 8, -3x + 2y = -10$

2. Solve using algebra. Make sure you check that your solutions work!

a) $\sqrt{2x+5} = \sqrt{3x-1}$

e) $\sqrt{x-4} + 3 > 4$

i) $3(2x-1) + 12 = 4x-3$

b) $-2|x-1| + 3 \geq -5$

f) $3|3-5x| - 3 = 18$

c) $4(x-2)^2 + 9 < 25$

g) $27 - 2(x-1)^2 = 9$

d) $\frac{5}{2x} + \frac{3}{4x^2} = \frac{2}{3x}$

h) $\frac{x-3}{7} = \frac{4x+12}{7}$

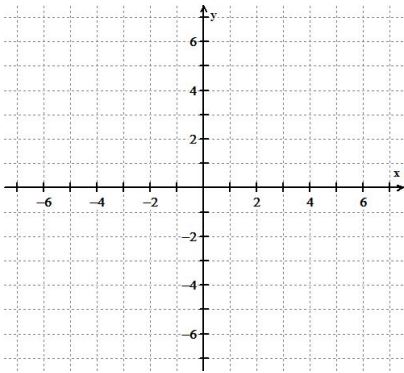
3. Solve using your calculator to help.

a) $|x+1| = \frac{1}{2}x + 3$

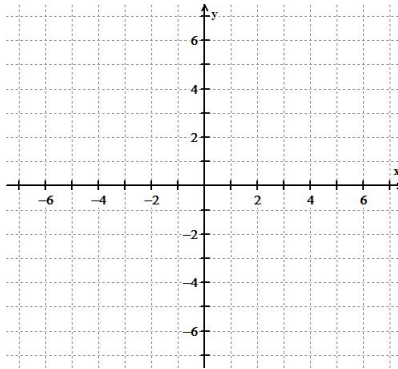
b) $(x+3)^2 - 2 < 3x + 7$

4. Sketch the systems of inequalities.

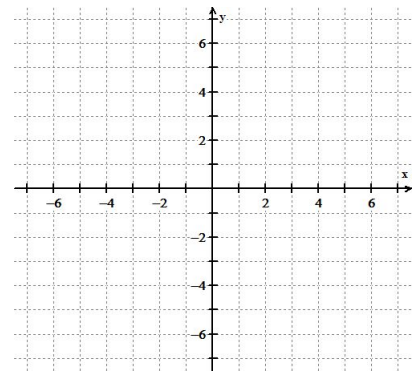
a) $\{y < -x - 2, y > x + 1\}$



b) $\{2x + 3y - 9 \geq 0, x + y - 6 < 0\}$



c) $\{x - y < -3, y \geq x^2 + 1\}$



Solve.

a) Two times a number added to another number is 25. Three times the first number minus the other number is 20. Find the two numbers.

b) At a sale on winter clothing, Cody bought two pairs of gloves and four hats for \$43.00. Tori bought two pairs of gloves and two hats for \$30.00. Find the prices of the hats and gloves.

c) A swimmer dives off a diving board into a pool below. The dive is represented by the equation $h(x) = -(x - 3)^2 + 23$ where $h(x)$ represents the height of the swimmer above the pool and x represents the horizontal distance from the diving board. Answer the following:

a. Make a sketch & label your axes.

b. How high above the water is the diving board?

c. How far away from the diving board do they land in the water?

d. When $x = 1$ what is $h(x)$? What does this mean in context of the problem?

e. When $x = 8$ what is $h(x)$? What does this mean in context of the problem?

f. When the swimmer is 22 feet in the air, how far away from the board are they?

g. When the swimmer is 25 feet in the air, how far away from the board are they?

d) Can you have a system of inequalities with no solution? Explain.