Math 105 - Homework 5 **Name:** _____

In each problem below, find an equation for the line that fits the description.

1. Passes through $(1, -2)$ and $(3, 4)$.

2. Passes through $(-4, 5)$ and $(8, 2)$

3. Has a slope of 5 and crosses the x-axis at $x = 3$.

4. Passes through $(3, 4)$ with slope of -6.

5. Find the slope and y-intercept of the line $4x + 6y = 24$.

6. Suppose that there are 4 inches of snow already on the ground when a new snow storm arrives. During the storm, snow falls at a rate of $2/3$ of an inch per hour.

   (a) Find a formula for the depth of the snow on the ground (y) as a function of the number of hours (x) that have passed since the storm started.

   (b) At this rate, how long would it be until the snow is 1 foot (12 inches) deep?

7. Suppose that $p(x) = x^2 - 8x + 12$. Find the roots of $p(x)$, then sketch a graph of $y = p(x)$. Be sure to label the coordinates of the vertex and the points where the graph crosses the x and y-axes.

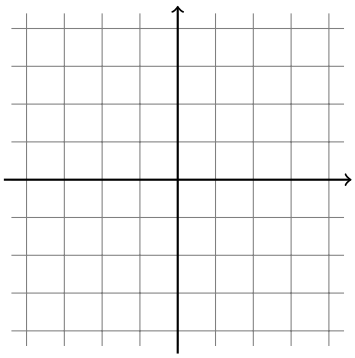
8. Find the x-values where the line $y = 2x + 5$ intersects the parabola $y = x^2 - 3$.

9. Find the x-values where the parabolas $y = 2x^2 - 5x - 3$ and $y = -x^2 + 4x + 9$ cross.

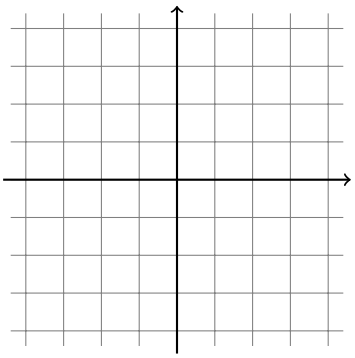
10. Suppose that a ball thrown into the air follows a parabolic trajectory with its height above the ground (in meters) obeying the formula $h(x) = -0.1x^2 + 0.7x + 0.6$ where x is the horizontal distance of the ball from the thrower. Find the roots and the vertex of this parabola.

Sketch graphs of the following equations. Be sure to label points where the graphs cross the x and y-axes.

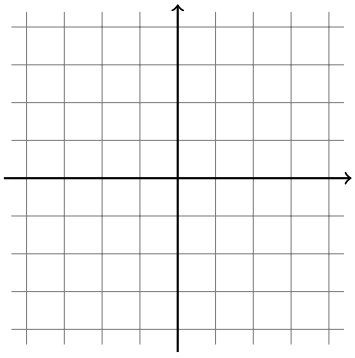
11. $y = \frac{1}{2}x - 3$



12. $y = \dfrac{x^2 - 2x - 8}{4}$



13. $3y - 2x = 6$



14. $y = -(x + 1)^2$