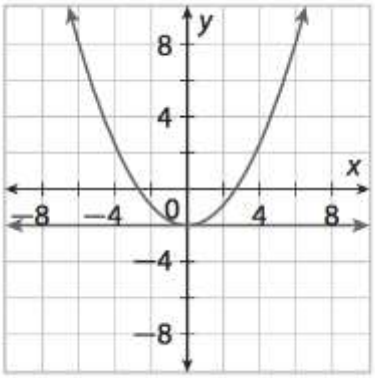
Word Problems!

1. Amy throws a quarter from the top of a building at the same time that a balloon is released from the ground. The equation describing the height *y* above the ground of the quarter in feet is $y = 64 - 2x^2$ where *x* is the time in seconds. The equation describing the elevation of the balloon in feet is $y = 6x + 8$ where *x* is the time in seconds. After how many seconds will the balloon and quarter pass each other?

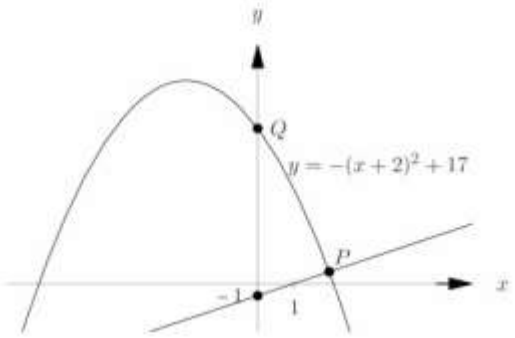
SAT question! 2. In the *xy*-plane, the parabola with equation $y = (x - 11)^2$ intersects the line with equation $y = 25$ at two points, A and B. What is the length of $\overline{AB}$?

A) 10
B) 12
C) 14
D) 16

3. **Analyze Relationships** The graph shows a quadratic function and a linear function $y = d$. If the linear function were changed to $y = d + 3$, how many solutions would the new system have? If the linear function were changed to $y = d - 5$, how many solutions would the new system have? Give reasons for your answers.



4. The figure shows graphs of a linear and a quadratic function.

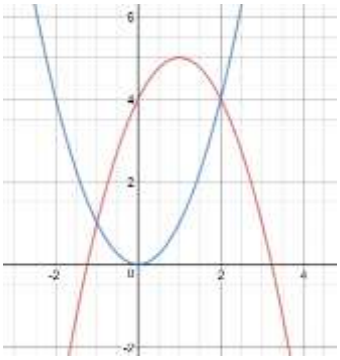


a. What are the coordinates of the point Q?

b. What are the coordinates of the point P?

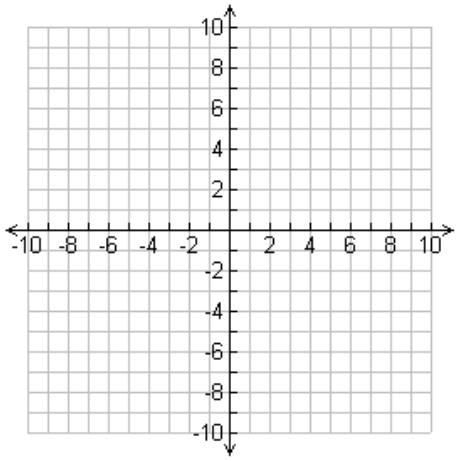
Homework

1. Identify the solution(s) to the system of equations graphed. Explain how you found the solution(s).



2. Solve the system of equations by graphing.

$y = (x + 2)^2 - 1$
$y = 3x + 5$



3. Solve the system of equations for #2 algebraically (you should find two solutions).

4. A map of a harbor is laid out on a coordinate grid, with the origin marking a buoy at the center of the harbor. A fishing boat is following a path that can be represented on the map by the equation $y = x^2 - 2x - 4$. A ferry is following a linear path that passes through the points (-3, 7) and (0, -5) when represented on the map.

a. Write and solve a system of equations for this situation.

b. Interpret the solution in the context of the situation.