

## SM2 7.2: Systems of Quadratic Equations

Using desmos.com/calculator, solve each system. Write your answer(s) as a point  $(x, y)$ . Round decimals to the nearest hundredth.

$$1) \begin{cases} y = x^2 - 12x - 45 \\ y = 3x - 45 \end{cases}$$

$(0, -45)$  and  $(15, 0)$

$$2) \begin{cases} y = x^2 - 7x + 10 \\ y = -\frac{5}{6}x + \frac{1}{2} \end{cases}$$

$(3, -2)$  and  $(3.17, -2.14)$

$$3) \begin{cases} y = x^2 + 5x - 3 \\ y = 2x - 10 \end{cases}$$

$\emptyset$

$$4) \begin{cases} y = -4x^2 + 7x + 12 \\ y = 7x + 12 \end{cases}$$

$(0, 12)$

$$5) \begin{cases} y = x^2 - 11x + 28 \\ y = -3x + 12 \end{cases}$$

$(4, 0)$

$$6) \begin{cases} y = 5x^2 + 4 \\ y = 4 \end{cases}$$

$(0, 4)$

$$7) \begin{cases} y = x^2 - 9x \\ y = -8x \end{cases}$$

$(0, 0)$  and  $(1, -8)$

$$8) \begin{cases} y = x^2 - 2x - 3 \\ y = -\frac{3}{2}x - 4 \end{cases}$$

$\emptyset$

$$9) \begin{cases} y = x^2 + x \\ y = 3x - 1 \end{cases}$$

$(1, 2)$

$$10) \begin{cases} y = .25x^2 + 5x - 3.4 \\ y = -4.5x + 7.5 \end{cases}$$

$(1.11, 2.48)$  and  $(-39.11, 183.52)$

$$11) \begin{cases} y = x^2 + 1 \\ y = x^2 - 1 \end{cases}$$

$\emptyset$

$$12) \begin{cases} y = x^2 - 1 \\ y = 2x^2 - 3 \end{cases}$$

$(-1.41, 1)$  and  $(1.41, 1)$

- 13) A car begins at rest and accelerates. Its distance in meters is given by  $D = 3t^2$ , with  $t$  measured in seconds. A second car, 4 meters ahead, is traveling at a constant speed of 15 meters per second. Its distance in meters is given by  $D = 15t + 4$ , with  $t$  measured in seconds. How long after the first car accelerates until the cars are side by side?

5.3 sec

- 14) A year-round ski shop sells both snowboarding and ski equipment. The revenue from selling snowboards can be modeled by the function  $R = -1.5s^2 + 30s$ , for which  $R$  is the revenue in hundreds of dollars from selling  $s$  sets of equipment. The revenue from selling skis can be modeled by the function  $R = 150s$ . Is there ever a time when the revenue from selling skis is the same as the revenue from selling snowboards?

No, the only solution is negative and you can't have negative revenue.