Practice 2.13: Solving Systems Algebraically B

For problems 1–5, solve each system of equations algebraically. Check your solutions graphically.

1. $\begin{cases} y = -2x^2 - 5 \\ y = -5 \end{cases}$

2. $\begin{cases} y = -x^2 + 4x + 6 \\ y = -2x + 11 \end{cases}$

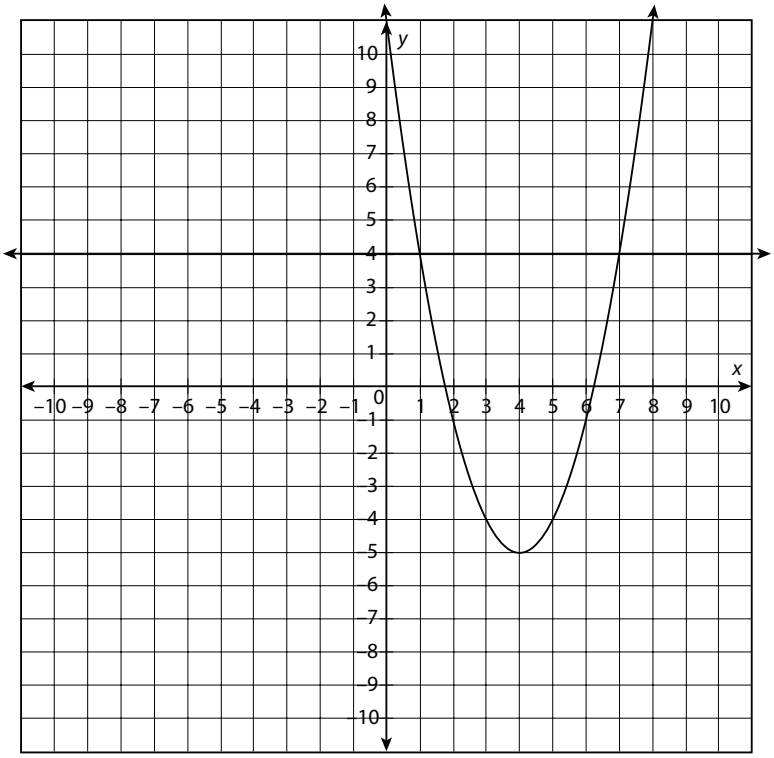
3. $\begin{cases} y = x^2 + 2x - 6 \\ y = \frac{1}{2}x - 7 \end{cases}$

4. $\begin{cases} y = -\frac{1}{4}x^2 + 2x \\ y = x \end{cases}$

5. $\begin{cases} y = x^2 + 3x - 9 \\ y = 5x - 8 \end{cases}$

For problems 6–8, solve each system of equations algebraically. Verify that your solutions match the provided graph. Show your work.

6. $\begin{cases} y = 4 \\ y = x^2 - 8x + 11 \end{cases}$



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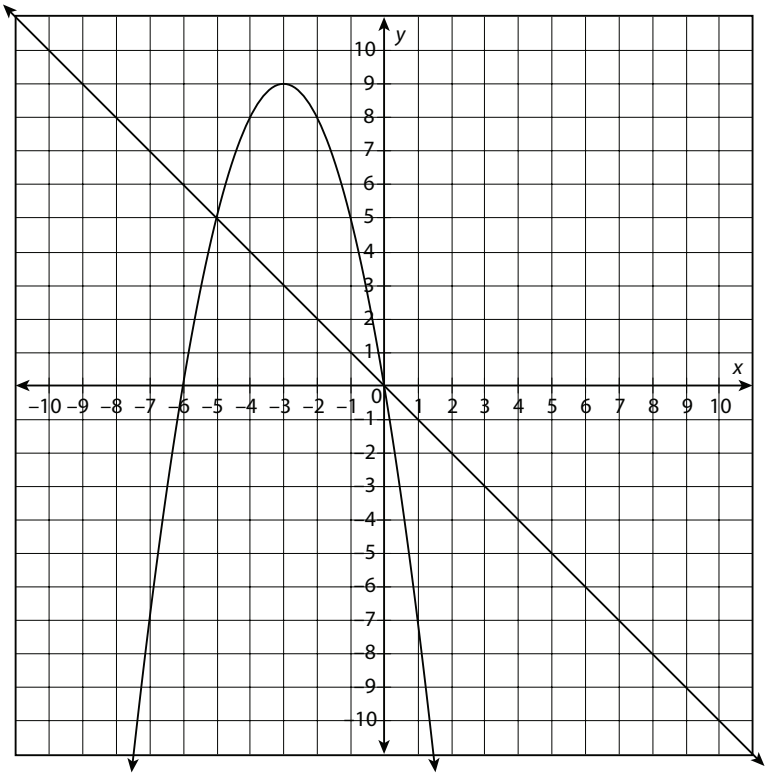
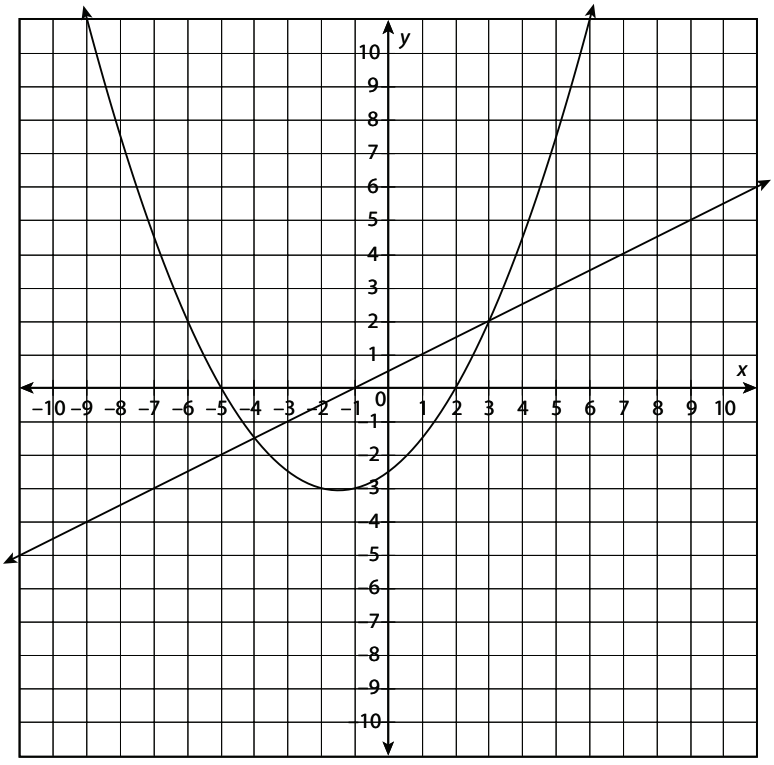
7. $\begin{cases} y = -x \\ y = -x^2 - 6x \end{cases}$



8. $\begin{cases} y = \frac{1}{2}x + \frac{1}{2} \\ y = \frac{1}{4}x^2 + \frac{3}{4}x - \frac{5}{2} \end{cases}$



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For problems 9 and 10, use the given information to write a system of equations, and then solve the system algebraically to answer the questions.

9. A soccer ball is kicked so that its height in feet t seconds after it is kicked can be modeled by the function $h(t) = -16t^2 + 45t + 1$. A hawk flies from its nest 45 feet above the ground at the same time that the player kicks the ball. The hawk's flight can be modeled by the function $h_2(t) = 45 - 12t$. After how many seconds will the hawk and ball first reach the same height above the ground?

10. Janetta is a hairstylist who accepts tips. Her profit P each week can be modeled by the function $P(c) = -200c^2 + 2400c - 4700$, where c is the charge per customer. Bertram is the manager at the salon. He is paid a flat rate and cannot accept tips. His profit each week can be modeled by the function $P(c) = 500$. What must Janetta charge in order for her profit to match Bertram's profit? Explain.

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