

LESSON **12.7** Assignment

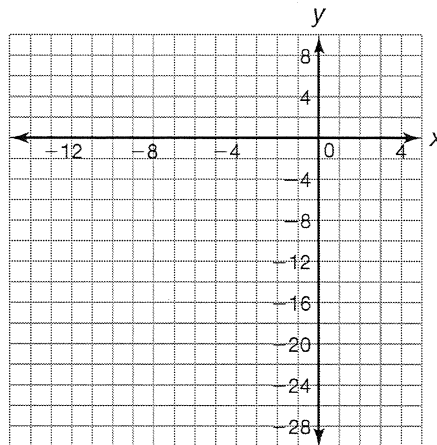
Name _____ Date _____

Another Method
Completing the Square

1. Determine the roots of the equation $y = x^2 + 9x + 3$. Check your solutions.

2. Consider the equation $y = 2x^2 + 10x - 8$.

a. Graph the equation.



- b. Use the graph to estimate the solutions to the equation. Explain how you determined your answer.
- c. Two students completed the square to find the solutions to this equation. Their work is shown below. Which student is correct? Explain your reasoning.

Student 1

$$\begin{aligned}
 y &= 2x^2 + 10x - 8 \\
 2x^2 + 10x - 8 &= 0 \\
 2x^2 + 10x &= 8 \\
 2x^2 + 10x + 25 &= 8 + 25 \\
 (2x + 5)^2 &= 33 \\
 \sqrt{(2x + 5)^2} &= \pm\sqrt{33} \\
 2x + 5 &= \pm\sqrt{33} \\
 x &= \frac{-5 \pm \sqrt{33}}{2} \\
 x \approx -5.372 \text{ or } x \approx 0.372
 \end{aligned}$$

Student 2

$$\begin{aligned}
 y &= 2x^2 + 10x - 8 \\
 2x^2 + 10x - 8 &= 0 \\
 \frac{2x^2 + 10x - 8}{2} &= 0 \\
 x^2 + 5x &= 4 \\
 x^2 + 5x + \frac{25}{4} &= 4 + \frac{25}{4} \\
 \left(x + \frac{5}{2}\right)^2 &= \frac{41}{4} \\
 \sqrt{\left(x + \frac{5}{2}\right)^2} &= \pm\sqrt{\frac{41}{4}} \\
 x + \frac{5}{2} &= \pm\frac{\sqrt{41}}{2} \\
 x &= \frac{-5 \pm \sqrt{41}}{2} \\
 x \approx -5.702 \text{ or } x \approx 0.702
 \end{aligned}$$

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- d. Compare the different solutions. Identify what the student who got the correct answer did that allowed him or her to correctly complete the square.
- e. Write a statement about the value of the coefficient of the x^2 -term before you can complete the square.

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3. Determine the roots of the equation $y = 3x^2 + 24x - 6$. Check your solutions.