

Lesson 13 Practice Problems

1. Add the number that would make the expression a perfect square. Next, write an equivalent expression in factored form.

a. $x^2 + 3x$

b. $x^2 + 0.6x$

c. $x^2 - 11x$

d. $x^2 - \frac{5}{2}x$

e. $x^2 + x$

2. Noah is solving the equation $x^2 + 8x + 15 = 3$. He begins by rewriting the expression on the left in factored form and writes $(x + 3)(x + 5) = 3$. He does not know what to do next.

Noah knows that the solutions are $x = -2$ and $x = -6$, but is not sure how to get to these values from his equation.

Solve the original equation by completing the square.

3. An equation and its solutions are given. Explain or show how to solve the equation by completing the square.

a. $x^2 + 20x + 50 = 14$. The solutions are $x = -18$ and $x = -2$.

b. $x^2 + 1.6x = 0.36$. The solutions are $x = -1.8$ and $x = 0.2$.

c. $x^2 - 5x = \frac{11}{4}$. The solutions are $x = \frac{11}{2}$ and $x = \frac{-1}{2}$.

4. Solve each equation.

a. $x^2 - 0.5x = 0.5$

b. $x^2 + 0.8x = 0.09$

c. $x^2 + \frac{13}{3}x = \frac{56}{36}$

5. Match each quadratic expression given in factored form with an equivalent expression in standard form. One expression in standard form has no match.

A. $(2 + x)(2 - x)$

1. $x^2 - 4$

B. $(x + 9)(x - 9)$

2. $81 - x^2$

C. $(2 + x)(x - 2)$

3. $x^2 - y^2$

D. $(x + y)(x - y)$

4. $4 - x^2$

5. $x^2 - 81$

(From Unit 7, Lesson 8.)

6. Four students solved the equation $x^2 + 225 = 0$. Their work is shown here. Only one student solved it correctly.

Student A:

$$\begin{aligned} x^2 + 225 &= 0 \\ x^2 &= -225 \\ x &= 15 \quad \text{or} \quad x = -15 \end{aligned}$$

Student B:

$$\begin{aligned} x^2 + 225 &= 0 \\ x^2 &= -225 \\ \text{No solutions} \end{aligned}$$

Student C:

$$\begin{aligned} x^2 + 225 &= 0 \\ (x - 15)(x + 15) &= 0 \\ x &= 15 \quad \text{or} \quad x = -15 \end{aligned}$$

Student D:

$$\begin{aligned} x^2 + 225 &= 0 \\ x^2 &= 225 \\ x &= 15 \quad \text{or} \quad x = -15 \end{aligned}$$

Determine which student solved the equation correctly. For each of the incorrect solutions, explain the mistake.

(From Unit 7, Lesson 9.)