Lesson 9 Practice Problems

1. Find **all** the solutions to each equation.

   a. $x(x-1)=0$

   b. $(5-x)(5+x)=0$

   c. $(2x+1)(x+8)=0$

   d. $(3x-3)(3x-3)=0$

   e. $(7-x)(x+4)=0$

2. Rewrite each equation in factored form and solve using the zero product property.

   a. $d^2-7d+6=0$

   b. $x^2+18x+81=0$

   c. $u^2+7u-60=0$

   d. $x^2+0.2x+0.01=0$

3. Here is how Elena solves the quadratic equation $x^2-3x-18=0$.

$$x^2-3x-18=0$$
$$(x-3)(x+6)=0$$
$$x-3=0 \quad \text{or} \quad x+6=0$$
$$x=3 \quad \text{or} \quad x=\text{-}6$$

   Is her work correct? If you think there is an error, explain the error and correct it.

   Otherwise, check her solutions by substituting them into the original equation and showing that the equation remains true.

4. Jada is working on solving a quadratic equation, as shown here.

$$\begin{aligned} p^2 - 5p &= 0 \\ p(p-5) &= 0 \\ p - 5 &= 0 \\ p &= 5 \end{aligned}$$

She thinks that her solution is correct because substituting 5 for p in the original expression $p^2 - 5p$ gives $5^2 - 5(5)$, which is $25 - 25$ or 0.

Explain the mistake that Jada made and show the correct solutions.

5. Choose a statement to correctly describe the zero product property.

If a and b are numbers, and $a \cdot b = 0$, then:

A. Both a and b must equal 0.

B. Neither a nor b can equal 0.

C. Either $a = 0$ or $b = 0$.

D. $a + b$ must equal 0.

(From Unit 7, Lesson 4.)

6. Which expression is equivalent to $x^2 - 7x + 12$?

A. $(x + 3)(x + 4)$

B. $(x - 3)(x - 4)$

C. $(x + 2)(x + 6)$

D. $(x - 2)(x - 6)$

(From Unit 7, Lesson 6.)

7. These quadratic expressions are given in standard form. Rewrite each expression in factored form. If you get stuck, try drawing a diagram.

a. $x^2 + 7x + 6$

b. $x^2 - 7x + 6$

c. $x^2 - 5x + 6$

d. $x^2 + 5x + 6$

(From Unit 7, Lesson 6.)

8. Select **all** the functions whose output values will eventually overtake the output values of function f defined by $f(x) = 25x^2$.

A. $g(x) = 5(2)^x$

B. $h(x) = 5^x$

C. $j(x) = x^2 + 5$

D. $k(x) = (\frac{5}{2})^x$

E. $m(x) = 5 + 2^x$

F. $n(x) = 2x^2 + 5$

(From Unit 6, Lesson 4.)

9. A piecewise function, p, is defined by this rule: $p(x) = \begin{cases} x - 1, & x \leq -2 \\ 2x - 1, & x > -2 \end{cases}$

Find the value of p at each given input.

a. $p(-20)$

b. $p(-2)$

c. $p(4)$

d. $p(5.7)$

(From Unit 4, Lesson 12.)