

## 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  $x^2 - 3x - 18 = 0$ .

$x^2 - 3x - 18 = 0$	Is her work correct? If you think there is an error, explain the error and correct it.
$(x - 3)(x + 6) = 0$	
$x - 3 = 0$ or $x + 6 = 0$	Otherwise, check her solutions by substituting them into the original equation and showing that the equation remains true.
$x = 3$ or $x = -6$	

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

$p^2 - 5p = 0$	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.
$p(p - 5) = 0$	
$p - 5 = 0$	
$p = 5$	

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

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.)