

## Exam 5 Prep: Chapters 9

1. Solve each equation.

(a)  $2x^2 = 64$

(b)  $(b - 3)^2 = 27$

(c)  $(4x - 5)^2 = 20$

(d)  $\left(x - \frac{1}{2}\right)^2 = \frac{3}{4}$

2. Since  $a^2 + 2ab + b^2$  can be written as  $(a + b)^2$ , each of the following equations can be solved using our square root property of equality. The first step is to write the trinomial on the left side of the equal sign as the square of a binomial. Solve each equation using this method.

(a)  $x^2 + 6x = 2$

(b)  $x^2 - 10x = 1$

(c)  $x^2 = 7 - 8x$

3. Use the algebraic method to solve each problem.

(a) The square of the sum of a number and 3 is 24. Find two values for the number to make this true.

(b) If you invest \$100 in an account with interest rate  $r$  compounded annually, the amount of money  $A$  in the account after 2 years is given by  $A = 100(1 + r)^2$ . Solve the formula for  $r$  in terms of  $A$ .

(c) A right triangle has hypotenuse = 17. If one leg has length 8, what is the length of the other leg?

4. For each given binomial, give the correct term you would add to ensure that the resulting trinomial is a perfect square.

(a)  $y^2 + 6y$

(b)  $x^2 - 2x$

(c)  $x^2 + 12x$

(d)  $x^2 - 20x$

5. Check each given value to see if it's a solution to the given equation.

(a) Is  $x = 2 - \sqrt{3}$  a solution to  $x^2 - 4x = 1$ ?

(b) Is  $x = \frac{1}{2} + \frac{\sqrt{2}}{2}$  a solution to  $x^2 - x = \frac{1}{4}$ ?

6. Solve the following equations

(a)  $\sqrt{4x + 16} + 4 = 10$

(b)  $\sqrt{2x + 6} = x - 1$

7. Suppose you solve a quadratic equation by completing the square and get the solutions  $x = \frac{1}{2}$  and  $x = -3$ . Could you have solved the equation by factoring? Why?

8. For each equation, first write it in standard form, then solve by completing the square.

(a)  $\frac{1}{x-1} + \frac{2}{x+3} = 1$

(b)  $(x - 3)(x + 2) = 6$

(c)  $3x^2 = 5 - 12x$

9. For each quadratic equation, find the coordinates of the vertex of the parabola, build a table of values centered on the vertex and construct a careful graph of the parabola.

(a)  $y = (x - 2)^2 - 4$

(b)  $y = x^2 - 2x - 3$

(c)  $y = x^2 - 6x$