

1.4 - Quadratic Equations

Review problems

1. **Solving linear equations.** Solve the following equation for x :

$$\frac{2x-5}{3} - \frac{x}{2} = \frac{x-1}{4}$$

2. **Factoring polynomials.** Factor:

(a) $x^2 - 5x - 14$ (b) $x^2 - 49$

3. **Operations on rational expressions.** Simplify:

(a) $\frac{3x^3 - 9x^2}{12x^2}$ (b) $\frac{(x-2)^2 - x^2}{x-1}$

4. **Operations on radicals.** Simplify:

(a) $\sqrt{16x^4}$ (b) $\sqrt{-2} + \sqrt{27}$ (c) $\sqrt{(-5)^2 - 4(2)(-3)}$

Basic knowledge

5. Solve the following quadratic equations:
 (a) $2(x+5) = 2x(x+1)$ (b) $x(x-3) = 3x(x+2)$
6. The diagonal of a square is 3 inches. Find the side, perimeter and area of this square.

Intermediate

7. The length of a rectangle is 6 feet greater than its width. The area of this rectangle is 40 ft^2 . Find the dimensions of the rectangle.
8. A 2-inch square is cut from each corner of a rectangular piece of cardboard whose length exceeds the width by 4 inches. The sides are then turned up to form an open box. Assuming that the volume of the box is 64 cubic inches, find the dimensions of the box.

Advanced

9. You want to expand your garden whose dimensions are 25 feet by 15 feet by planting a border of flowers. The border is to be of the same width around the entire garden. The flowers you bought will fill an area of 624 square feet. How wide should the border be?
10. Solve the following equation for x :
 $x^2 - x = \sqrt{2x} + \sqrt{5}$