

## 6.6 Solving Quadratic Equations by Factoring

Zero Factor Theorem:

If  $ab=0$ , then  $a=0$  or  $b=0$ .

$$6. (x - 7)(x + 3) = 0$$

$$x - 7 = 0$$

$$x = 7$$

or

$$x + 3 = 0$$

$$x = -3$$

$$16. (m - 4)^2 = 0$$

$$m - 4 = 0$$

$$m = 4$$

or

or

$$m - 4 = 0$$

$$m = 4$$

$$18. y^2 - 25 = 0$$

$$(y+5)(y-5) = 0$$

$$y+5=0 \quad \text{or} \quad y-5=0$$

$$y=-5 \quad \text{or} \quad y=5$$

$$y = -5, 5$$

or

$$y = \pm 5$$

$$y^2 - 25 = 0$$

$$y^2 = 25$$

$$y = 5, -5$$

## Quadratic Equation

$$22. p^2 - 16p + 64 = 0$$

$$\frac{64}{8,8}$$

$$(p - 8)(p - 8) = 0$$

$$p - 8 = 0 \quad \text{or} \quad p - 8 = 0$$

$$p = 8$$

$$28. \quad 6k^2 - 7k = -1$$

$$\frac{6k^2}{1,6}$$

$$\overbrace{6k^2 - 7k + 1} = 0$$

$$\underbrace{6k^2 - k}_{\text{blue}} - \underbrace{6k}_{\text{green}} + 1 = 0$$

$$k(\underline{6k-1}) - 1(\underline{6k-1}) = 0$$

$$(6k-1)(k-1) = 0$$

$$6k-1 = 0 \quad \text{or} \quad k-1 = 0$$

$$6k = 1$$

$$k = 1$$

$$k = \frac{1}{6}$$

$$34. m(m + 6) = -9$$

$$\frac{9}{3,3}$$

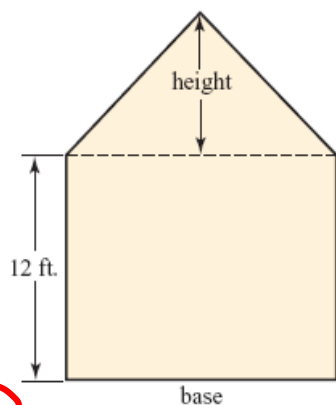
$$m^2 + 6m + 9 = 0$$

$$(m + 3)(m + 3) = 0$$

$$m + 3 = 0$$

$$m = -3$$

48. The front elevation of one wing of a house is shown. Because of budget constraints, the total area of the front of this wing must be 352 square feet. The height of the triangular portion is 14 feet less than the base. Find the base length.



base :  $b$

height :  $h$

$$h = b - 14$$

$$A_{\Delta} = \frac{1}{2}bh$$

$$A_{\square} = 2w$$

$$A_{\text{tot}} = A_{\Delta} + A_{\square}$$

$$A_{\Delta} = \frac{1}{2}bh = \frac{1}{2}b(b-14)$$

$$A_{\square} = 12b$$

$$A_{\text{tot}} = \frac{1}{2}b(b-14) + 12b = 352$$

$$\frac{1}{2}b^2 - 7b + 12b = 352$$

$$2\left(\frac{1}{2}b^2 + 5b - 352\right) = (0)2$$

$$b^2 + 10b - 704 = 0$$

$$(b - 22)(b + 32) = 0$$

$$b = 22, -32$$

$$\frac{-704}{4, 176}$$

$$11, 64$$

$$16, 44$$

$$22, 32$$

$$22, 32$$

## Intermediate Algebra & Trig --

### 7.1 Simplifying Rational Expressions

#### Evaluate the Rational Expression

8.  $-\frac{x}{y^3}$       a. when  $x = 1, y = 2$       b. when  $x = -2, y = 3$       c. when  $x = -4, y = -2$

12.  $\frac{x^2 + 3}{2x + 1}$       a. when  $x = 2.1$       b. when  $x = -2$       c. when  $x = 1$

**Find value of the variable that makes the expression undefined**

16.  $\frac{3y}{y + 5}$

20.  $\frac{2x + 3}{x^2 + 5x + 6}$

## Simplify

$$26. \frac{14h^3k}{21h}$$

$$30. -\frac{48t^5uv}{32tv^4}$$

$$34. \frac{9}{18(a-1)}$$

$$38. \frac{12y+2}{18y+3}$$

$$42. \frac{ab-b^2}{2a-2b}$$

$$46. \frac{x^2-16}{x^2+6x+8}$$

$$50. \frac{3x^2+16x-35}{5x^2+33x-14}$$

$$66. \frac{2y^2-8}{2-y}$$

$$70. \frac{12-4m}{m-3}$$

## 7.2 Multiplying and Dividing Rational Expressions

$$8. \frac{x}{y} \cdot \frac{3x}{2y}$$

$$12. \frac{7mn^2}{8m^2n} \cdot \frac{16mz^2}{49n^2z}$$

$$16. \frac{9}{2a+4} \cdot \frac{3a+6}{15}$$

$$18. \frac{m^2+5m}{m^2-16} \cdot \frac{m^2-4m}{m^2-25}$$

$$28. \frac{2m-3n}{m^2+4mn+4n^2} \cdot \frac{5m^2+10mn}{3mn-3n^2} \cdot \frac{4m^2-4n^2}{4m^2-9n^2}$$

$$30. \frac{x}{2} \div \frac{x}{4}$$

$$34. \frac{7a^2b}{2c^2} \div \frac{7a^2}{b}$$

$$38. \frac{a^2-b^2}{x^2-y^2} \div \frac{a+b}{x-y}$$

$$42. \frac{3a + 6}{5} \div \frac{4a + 8}{10a}$$

$$46. \frac{3w^2 - 7w - 6}{w^2 - 9} \div \frac{9w^2 - 4}{3w^2 + 7w - 6}$$

$$50. \frac{u^2 - 2u - 8}{u^2 + 3u + 2} \div (u^2 - 3u - 4)$$

$$54. \frac{12h^2 + 11h - 5}{h^4 - 16} \div \frac{h - 3h^2}{h^3 + 4h - 2h^2 - 8} \div \frac{4h + 5}{h^3}$$

$$56. \frac{t^2 - 2t}{2t} \cdot \frac{2}{t} \cdot \frac{2t}{t^2 - 4t + 4} \div \frac{t + 2}{t - 2}$$

### 7.3 Adding and Subtracting Rational Expressions with the Same Denominator

$$6. \frac{2x}{9} + \frac{x}{9}$$

$$12. \frac{16x + y}{x - y} + \frac{10x - 15y}{x - y}$$

$$15. \frac{m+3}{m^2-1} - \frac{4}{m^2-1}$$

$$30. \frac{s^2+2s}{s^2+4s+4} - \frac{s^2+s-2}{s^2+4s+4}$$

$$36. \frac{2m^2-6m}{m^2-5m+6} + \frac{2m-4}{m^2-5m+6} + \frac{4}{m^2-5m+6}$$

## 7.4 Adding and Subtracting Rational Expressions with the Different Denominator

$$20. \frac{3x-y}{6} - \frac{3x-2y}{4}$$

$$26. \frac{5m}{m^2-mn} + \frac{3}{m}$$

$$28. \frac{2}{c+4} + \frac{3}{c+3}$$

$$32. \frac{a+6}{a^2+8a+15} - \frac{a-3}{a+3}$$

$$38. \frac{x}{x-7} - \frac{x+3}{x^2-4x-21}$$

$$44. \frac{u}{u-1} + \frac{2u}{u^2-2u+1}$$

$$50. \frac{x+1}{x^2-4x+4} + \frac{4}{x^2+3x-10}$$

$$56. \frac{m^2}{m^2-m+1} - \frac{m+1}{m}$$

## 7.5 Complex Rational Expressions

$$8. \frac{\frac{2}{3}}{\frac{3}{2}}$$

$$12. \frac{\frac{2}{3} + \frac{1}{4}}{1 + \frac{1}{2}}$$

$$16. \frac{\frac{5}{2x-1}}{\frac{x}{x+1}}$$

$$20. \frac{\frac{a}{b} - 1}{a^2 - b^2}$$

$$24. \frac{x - \frac{1}{x}}{1 + \frac{1}{x}}$$

$$28. \frac{\frac{k+2}{k^2-3k}}{\frac{k^2-4}{k}}$$

$$34. \frac{\frac{1}{f+2} - \frac{1}{f-3}}{1 + \frac{1}{f^2 - f - 6}}$$

$$36. \frac{1 - \frac{3}{x}}{1 - \frac{2}{x} - \frac{3}{x^2}}$$

$$38. \frac{\frac{v^2 + v - 2}{v^2 + 4v}}{\frac{2v^2 - 8}{v^2 + 2v - 8}}$$

$$44. \frac{1 - \frac{1}{u^2}}{1 + \frac{2}{u} + \frac{1}{u^2}}$$

