

6.6 Solving Quadratic Equations by Factoring

Zero Factor Theorem:

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

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

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

18. $y^2 - 25 = 0$

Quadratic Equation

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

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

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

26.

Factor.

$$3a^2 + 6a - 24$$

$$3(a^2 + 2a - 8)$$

$$3(a - 2)(a + 4)$$

$$\begin{array}{c} \boxed{2a} \\ +4a \end{array}$$

$$\frac{-8}{-}$$

$$1, 8$$

$$2, 4$$

20.

Factor completely.

$$b^4 - 81$$

$$(b^2)^2 - 9^2$$

$$(b^2 + 9)(b^2 - 9)$$

$$(b^2 + 9)(b + 3)(b - 3)$$

29.

Factor.

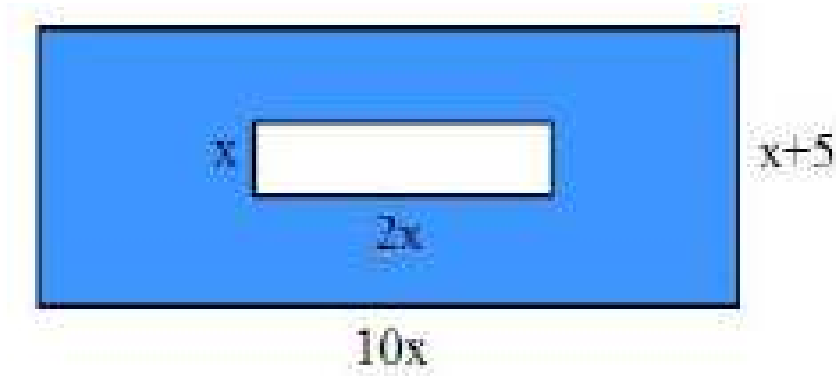
$$9a - 49a^3$$

$$a(9 - 49a^2)$$

$$a[(3)^2 - (7a)^2]$$

$$a(3 + 7a)(3 - 7a)$$

5.



$$\text{Area} = A_{\text{Big}} - A_{\text{Little}}$$

$$A_{\text{Big}} = 10x(x+5) \quad A_{\text{Little}} = 2x(x)$$

$$\text{Area} = 10x(x+5) - 2x(x)$$

$$= 10x^2 + 50x - 2x^2$$

$$= 8x^2 + 50x$$

$$= 2x(4x+25)$$

15.

Factor by grouping.

$$108v^2 - 267v + 54$$

$$3(36v^2 - 89v + 18)$$

$$3[36v^2 - 8v - 81v + 18]$$

$$3[4v(9v-2) - 9(9v-2)]$$

$$3(9v-2)(4v-9)$$

$$\underline{648}$$

$$18, 36$$

$$2, 324$$

$$3, 216$$

$$4, 162$$

$$6,$$

$$8, 81$$

38. Find every number such that triple the square of the number is equal to four times that number.

$$3(x^2) = 4x$$

$$3x^2 - 4x = 0$$

$$x(3x - 4) = 0$$

$$x = 0$$

$$3x - 4 = 0$$

$$3x = 4$$

$$x = \frac{4}{3}$$

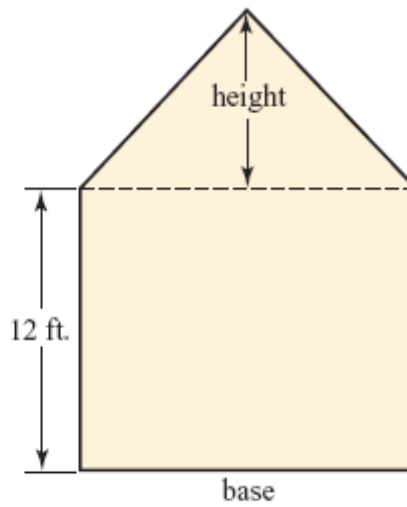
$$x = 0, \frac{4}{3}$$

40. The product of two consecutive natural numbers is 306. Find the numbers.

$$\begin{array}{l} n \\ n+1 \end{array} \quad n(n+1) = 306$$

42. The difference of the squares of two consecutive even natural numbers is 60.

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.



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

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

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

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

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

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

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

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

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

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

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

