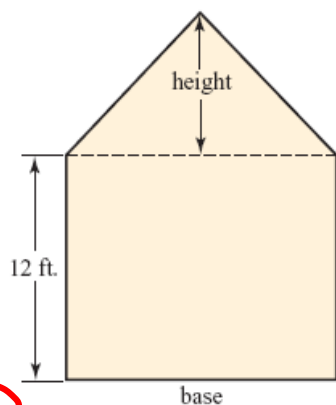


48. The front elevation of one wing of a house is shown. Because of budget constraints, the total area of the front of this wing must be 352 square feet. The height of the triangular portion is 14 feet less than the base. Find the base length.



base : b

height : h

$$h = b - 14$$

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

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

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

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

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

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

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

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

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

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

$$\begin{array}{l|l} b - 22 = 0 & \cancel{b + 32 = 0} \\ b = 22 & \cancel{b = -32} \end{array}$$

$$\frac{-704}{}$$

$$1, 704$$

$$2, 352$$

$$4, 176$$

$$8, 88$$

$$16, 44$$

$$22, 32$$

The base is 22 feet.

$$7t = 12 + t^2$$

$$0 = t^2 - 7t + 12$$

⋮

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 $x = -4, y = -2$

$$-\frac{1}{(2)^3} = -\frac{1}{8}$$

$$-\frac{-4}{(-2)^3} = -\frac{-4}{-8} = -\frac{1}{2}$$

12. $\frac{x^2 + 3}{2x + 1}$

a. when $x = 2.1$

b. when $x = -2$

c. when $x = 1$

$$\frac{(-2)^2 + 3}{2(-2) + 1} = \frac{4 + 3}{-4 + 1} = \frac{7}{-3} = -\frac{7}{3}$$

$$\frac{(1)^2 + 3}{2(1) + 1} = \frac{1 + 3}{2 + 1} = \frac{4}{3}$$

Find value of the variable that makes the expression undefined

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

$$y+5 \neq 0$$

$$y \neq -5$$

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

$$x^2+5x+6 \neq 0$$

$$(x+3)(x+2) \neq 0$$

$$x+3 \neq 0 \quad | \quad x+2 \neq 0$$

$$x \neq -3 \quad | \quad x \neq -2$$

Simplify

$$26. \frac{\overset{2}{\cancel{14}h^3k}}{\underset{3}{\cancel{21}h}} = \frac{2h^2k}{3}$$

$$30. -\frac{\overset{3}{\cancel{48}t^5uv}}{\underset{2}{\cancel{32}tv^4}} = -\frac{3t^4u}{2v^3}$$

$$34. \frac{\overset{1}{\cancel{9}}}{\underset{2}{\cancel{18}(a-1)}} = \frac{1}{2(a-1)}$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

