In addition to the questions below, review the material from the Rational Equations Applications handout

Solve.

- [1] w varies directly as y and inversely as z. w = 12 when y = 8 and z = 5. Find the value of w when y = 6 and z = 15.
- [2] b varies directly as the square root of c. b = 12 when c = 16. Find the value of c when b = 18.
- [3] The height of a 1 liter water bottle varies inversely with the square of the radius of its base. A bottle with radius 5.4 cm is 11 cm tall. How tall is a bottle with radius 4.1 cm ?
- [4] The cost of insuring a delivery varies jointly with the number of items in the delivery and the value of each item. It costs \$15 to insure a delivery of 25 items each valued at \$20 dollars. How much does it cost to insure a delivery of 3 items each valued at \$80 ?

Solve for x in the following similar triangles.



<u>Simplify.</u>

$$[8] \qquad \frac{x^3 + 8x^2 - 48x}{3x^2 + 6x - 72} \qquad [9] \qquad \frac{6x^2 - x - 1}{2x^2 + 9x - 5} \qquad [10] \qquad \frac{\frac{3}{x - 2} - 2}{\frac{4}{x - 2} + 1} \qquad [11] \qquad \frac{\frac{2}{x - 3} - \frac{3}{x}}{\frac{5}{x - 3} + \frac{2}{x}}$$

Perform the algebraic operations and simplify.

$$[12] \quad \frac{4x^2 - 1}{x^2 - 16} \cdot \frac{x^2 - 4x}{2x + 1} \qquad [13] \quad \frac{2x^2 - x - 6}{3x^2 + 4x + 1} \cdot \frac{3x^2 + 7x + 2}{2x^2 + 7x + 6}$$

$$[14] \quad \frac{x^2 + 2x - 15}{x^2 + 3x - 10} \div \frac{x^2 - 9}{x^2 - 9x + 14} \qquad [15] \quad \frac{9x^2 - 25}{2x - 2} \div \frac{6x - 10}{x^2 - 1}$$

$$[16] \quad \frac{x^2 - 5x}{2x - 8} + \frac{12 - 2x}{2x - 8} \qquad [17] \quad \frac{2x^2 - x}{x^2 - 9} - \frac{x^2 + 12}{x^2 - 9}$$

[18]
$$\frac{x}{x+2} + \frac{2}{x-3}$$
 [19] $\frac{x}{x+2} - \frac{6}{x^2 + x - 2}$

[20]
$$\frac{x+1}{x^2-7x+6} - \frac{x-2}{x^2-4x-12}$$

Solve for x.

[21]
$$\frac{x-1}{3} = \frac{8}{x+4}$$
 [22] $\frac{3}{x} + \frac{10}{x^2} = 1$ [23] $\frac{6}{x+3} - \frac{2}{x+2} = 1$
[24] $\frac{4}{x^2-4} - \frac{2}{x^2-2x} = \frac{3}{x^2+2x}$

[25] Find the equations of the horizontal and vertical asymptotes of $y = \frac{7 - 9x}{12x + 8}$.

ANSWERS

[1]	w = 3	[2]	<i>c</i> = 36	[3]	19.1 cm	[4]	\$7.20
[5]	<i>x</i> = 25	[6]	x = 3	[7]	<i>x</i> = 5	[8]	$\frac{x(x+12)}{3(x+6)}$
[9]	$\frac{3x+1}{x+5}$	[10]	$\frac{7-2x}{x+2}$	[11]	$\frac{9-x}{7x-6}$	[12]	$\frac{x(2x-1)}{x+4}$
[13]	$\frac{x-2}{x+1}$	[14]	$\frac{x-7}{x+3}$	[15]	$\frac{(3x+5)(x+1)}{4}$	[16]	$\frac{x-3}{2}$
[17]	$\frac{x-4}{x-3}$	[18]	$\frac{x^2-x+4}{(x+2)(x-3)}$	[19]	$\frac{x-3}{x-1}$	[20]	$\frac{6x}{(x-1)(x-6)(x+2)}$
[21]	x = 4 or $x = -7$	[22]	x = 5 or x = -2	[23]	x = 0 or x = -1	[24]	no solution
[25]	horizontal asymptote:	<i>y</i> =	$\frac{3}{4}$, vertical asymptote:	$x = -\frac{2}{3}$			