

QE3 DEBRIEF

$$\textcircled{1} \left(\frac{8x^3y^5}{4x^5yz} \right)^3 = \left(\frac{2y^4}{x^2z} \right)^3 = \boxed{\frac{8y^{12}}{x^6z^3}}$$

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

$$\textcircled{2} 2x \left(\frac{x^2y^5}{xy^2} \right)^{-1} = 2x (xy^3)^{-1} = 2x \left(\frac{1}{xy^3} \right)$$
$$= \frac{2x}{xy^3} = \frac{2}{y^3}$$

$$2x \left(\frac{xy^2}{x^2y^5} \right) = \frac{2x^{\cancel{2}}y^2}{x^{\cancel{2}}y^5} = \frac{2}{y^3}$$

$$\textcircled{4} \left(\frac{a^5 b^3}{x^{-1} y^1} \right)^{-5} = \left(\frac{a^5 b^3 x}{y} \right)^{-5} = \frac{y^5}{a^{25} b^{15} x^5}$$

$$\textcircled{17} \quad 27x^4 - 8x$$
$$x(27x^3 - 8)$$
$$x(3x - 2)(9x^2 + 6x + 4)$$

$$\textcircled{18} \quad 3x^3 y - 3xy$$
$$3xy(x^2 - 1)$$
$$3xy(x+1)(x-1)$$

$$\begin{aligned} \textcircled{19} \quad & 3x^2 - 24x + 48 \\ & 3(x^2 - 8x + 16) \\ & 3(x-4)^2 \end{aligned}$$

$$\begin{aligned} & \quad \quad \quad 144 \\ & \quad \quad \quad -12 \quad -12 \\ & 3x^2 - 12x - 12x + 48 \\ & 3x(x-4) - 12(x-4) \\ & (3x-12)(x-4) \\ & 3(x-4)(x-4) \end{aligned}$$

$$\begin{aligned} \textcircled{20} \quad & 10x^2 - xy - 2y^2 \\ & (10x^2 - 5xy) + (4xy - 2y^2) \\ & 5x(2x-y) + 2y(2x-y) \\ & (5x+2y)(2x-y) \end{aligned}$$

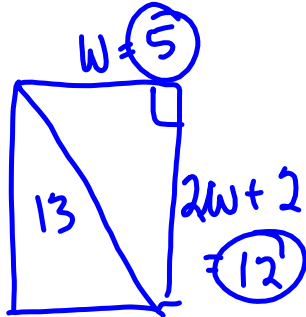
$$\begin{aligned} ac &= (10)(-2) = -20 \\ & (-5)(4) \end{aligned}$$

$$(21) D = vt$$

$$\frac{93000000}{2 \times 10^{35}} = \frac{(2 \times 10^{35}) t}{2 \times 10^{35}}$$

$$t = \frac{9.3 \times 10^7}{2 \times 10^{35}} = 4.65 \times 10^{-28} \text{ hrs}$$

(22)



$$ac = (5)(-165) = -825$$

$$\begin{matrix} -25 & 33 \end{matrix}$$

$$a^2 + b^2 = c^2$$

$$w^2 + (2w+2)^2 = 13^2$$

$$w^2 + 4w^2 + 8w + 4 = 169$$

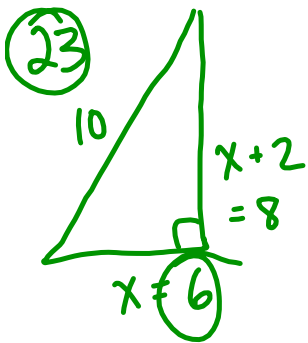
$$5w^2 + 8w - 165 = 0$$

$$(5w^2 - 25w) + (33w - 165) = 0$$

$$5w(w-5) + 33(w-5) = 0$$

$$\underline{\underline{(5w+33)(w-5) = 0}}$$

$$w-5 = 0 \rightarrow w = 5$$



$$a^2 + b^2 = c^2$$

$$x^2 + (x+2)^2 = 10^2$$

$$x^2 + x^2 + 4x + 4 = 100$$

$$2x^2 + 4x - 96 = 0$$

$$x^2 + 2x - 48 = 0$$

$$~~(x+8)(x-6) = 0~~$$

$$x - 6 = 0 \rightarrow x = 6 \text{ ft.}$$

24

$$\frac{1.3 \times 10^{-12}}{2} = 0.65 \times 10^{-12} = 6.5 \times 10^{-13} \text{ m}$$

6.6 SOLVING EQUATIONS WITH RATIONAL EXPRESSIONS

Ex. 1

$$6 \left[\frac{1}{2} - \frac{x-2}{3} = \frac{1}{6} \right]$$

$$\frac{6 \cdot 1}{2} - \frac{6(x-2)}{3} = \frac{6 \cdot 1}{6}$$

$$3 - 2(x-2) = 1$$

$$3 - 2x + 4 = 1$$

$$-2x + 7 = 1$$

$$\begin{array}{r} -7 \\ \hline \end{array} \quad \begin{array}{r} -7 \\ \hline \end{array}$$

$$\frac{-2x}{-2} = \frac{-6}{-2}$$

$$x = 3$$

~~$$3 - 2(x-2) = 1$$~~

~~$$-3 - 3 = -3$$~~

~~$$2(x-2) = 2$$~~

~~$$-2 = 2$$~~

~~$$x - 2 = 1$$~~

~~$$-2 = 2$$~~

~~$$x = 3$$~~

Ex. 2

$$12x \left[\frac{1}{x} + \frac{1}{6} = \frac{1}{4} \right]$$

$$\frac{12x}{x} + \frac{12x}{6} = \frac{12x}{4}$$

$$12 + 2x = 3x$$

$$\underline{-2x} \quad \underline{-2x}$$

$$12 = x$$

Ex. 3

$$\left[\frac{100}{x} + \frac{100}{x+5} = 9 \right] x(x+5)$$

$$\frac{100 \cancel{x}(x+5)}{\cancel{x}} + \frac{100 \cancel{x}(x+5)}{(x+5)} = 9x(x+5)$$

$$\begin{array}{r} -9x^2 \\ \underline{100x + 500 + 100x} \\ -9x^2 + 200x + 500 \end{array} = \begin{array}{r} 9x^2 + 45x \\ \underline{-9x^2 - 45x} \\ 0 \end{array}$$

$$-9x^2 + 200x + 500 = 0$$

$$(-9x^2 + 180x) + (25x + 500) = 0$$

$$-9x(x-20) - 25(x-20) = 0$$

$$(9x-25)(x-20) = 0$$

$$-(9x+25)(x-20) = 0$$

$$\begin{array}{r} 9x + 25 = 0 \\ -25 \quad -25 \\ \hline 9x = -25 \end{array}$$

$$\frac{9x}{9} = \frac{-25}{9}$$

$$x = -\frac{25}{9}$$

$$\begin{array}{r} x - 20 = 0 \\ +20 \quad +20 \\ \hline x = 20 \end{array}$$

$$x = 20$$

$$(-9)(500)$$

$$= -4500$$

$$180(-25)$$

$$\frac{100}{-\frac{25}{9}} + \frac{100}{-\frac{25}{9} + \frac{45}{9}} = \frac{-9 \cdot 100}{25} + \frac{9 \cdot 100}{20} = -36 + 45 = 9$$

Ex. 4

$$\left[\frac{1}{x-2} = \frac{x}{2x-4} + 1 \right] 2(x-2)$$

$$\frac{\cancel{2(x-2)}}{\cancel{(x-2)}} = \frac{\cancel{2x}(\cancel{x-2})}{\cancel{2(x-2)}} + 2(x-2)$$

$$2 = x + 2x - 4$$

$$\begin{array}{r} 2 = 3x - 4 \\ +4 \quad \quad +4 \\ \hline \end{array}$$

$$\frac{6}{3} = \frac{3x}{3}$$

$$x = 2$$

NO SOLUTION

$$\frac{1}{x-2} = \frac{x}{2x-4} + 1$$

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

$$\frac{1}{0} = \frac{2}{0} + 1$$

6.8 APPLICATIONS

Ex. 1

A LINE THROUGH $(-2, 4)$ WITH $m = \frac{3}{2}$

CAN BE WRITTEN AS

$$\left[\frac{y-4}{x+2} = \frac{3}{2} \right] 2(x+2)$$

$$\frac{2(y-4)}{2} = \frac{3(x+2)}{2}$$

$$y-4 = \frac{3}{2}x + 3$$

$$y = \frac{3}{2}x + 7$$

Ex. 5

D = R T

THERE

1500	$x = 60$	$\frac{1500}{x}$
1500	$x - 10$ $= 50$	$\frac{1500}{x - 10}$

BACK

$$\left[5 + \frac{1500}{x} = \frac{1500}{x-10} \right] x(x-10)$$
$$5x(x-10) + \frac{1500x(x-10)}{x} = \frac{1500x(x-10)}{(x-10)}$$

$$5x^2 - 50x + \cancel{1500x} - 15000 = \cancel{1500x} - \cancel{1500x}$$

$$\frac{5x^2 - 50x - 15000}{5} = \frac{0}{5}$$

$$x^2 - 10x - 3000 = 0$$

$$(x + 50)(x - 60) = 0$$

$$x = -50 \quad x = 60$$

Ex. 6

RATE \times TIME = WORK

B	$\frac{1}{30}$	20	$\frac{20}{30}$
A	$\frac{1}{x}$	20	$\frac{20}{x}$

$$30x \left[\frac{20}{30} + \frac{20}{x} = 1 \right]$$

$$\frac{20 \cdot \cancel{30}x}{\cancel{30}} + \frac{20 \cdot 30x}{x} = 30x$$

$$\begin{array}{r} 20x + 600 = 30x \\ \underline{-20x} \quad \quad \quad \underline{-20x} \end{array}$$

$$\frac{600}{10} = \frac{10x}{10}$$

$$x = 60 \text{ MIN.}$$