

Quiz #1 SOLUTIONS

$$\begin{aligned}
 (1) \quad x - 5[x - 5(x - 5)] &= \\
 &= x - 5[x - 5x + 25] \\
 &= x - 5[-4x + 25] \\
 &= x + 20x - 125 \\
 &= \boxed{21x - 125}
 \end{aligned}$$

$$\begin{aligned}
 (2) \quad \frac{5}{6} &= \frac{2u - 3}{5} \\
 5 \cdot 5 &= 6(2u - 3) \\
 25 &= 12u - 18 \\
 25 + 18 &= 12u \\
 43 &= 12u \Rightarrow \boxed{u = \frac{43}{12}}
 \end{aligned}$$

$$(6) \quad \frac{w+3}{6} - \frac{w+4}{2} = 2$$

$$\text{LCD} = 6$$

$$w + 3 - 3(w + 4) = 6 \cdot 2$$

$$w + 3 - 3w - 12 = 12$$

$$-2w - 9 = 12$$

$$-2w = 21$$

$$\boxed{w = \frac{-21}{2}}$$

$$(c) \quad A = 2lw + 2lh + 2wh$$

solve for l

$$A = 2l(w+h) + 2wh$$

$$A - 2wh = 2l(w+h)$$

$$\boxed{l = \frac{A - 2wh}{2(w+h)}}$$

$$(3) \quad f(x) = \frac{3x-1}{x-5}$$

(a) Domain = ?

$$\text{Condition: } x - 5 \neq 0 \\
 x \neq 5$$

$$\boxed{\text{Domain} = \mathbb{R} \setminus \{5\}}$$

$$(b) \quad f(-1) = \frac{3(-1)-1}{(-1)-5}$$

$$= \frac{-4}{-6} = \frac{2}{3}$$

$$\boxed{f(-1) = \frac{2}{3}}$$

$$(c) \quad f(a+h) = \frac{3(a+h)-1}{a+h-5}$$

$$\boxed{f(a+h) = \frac{3a+3h-1}{a+h-5}}$$

$$(4) \quad (a) \quad f(3) = 0.83 \$$$

The cost of mailing a 3 ounce letter is 0.83 \$

$$(b) \quad C = ? \text{ if } x = 1.5 \text{ ounces}$$

$$f(1.5) = 0.60 \$$$

$$(c) \quad f(x) = 0.83$$

$$x \in (2, 3]$$

-2-

$$\begin{aligned} (5) (R-C)(x) &= R(x) - C(x) \\ &= 65x - (600,000 + 45x) \\ &= 65x - 600,000 - 45x \end{aligned}$$

$$(R-C)(x) = 20x - 600,000$$

$$\begin{aligned} a) (R-C)(20,000) &= \\ &= 20(20,000) - 600,000 \\ &= -200,000 \end{aligned}$$

If the company produces and sells 20,000 radios, it will have a loss of 200,000 \$

$$\begin{aligned} b) (R-C)(40,000) &= \\ &= 20(40,000) - 600,000 \\ &= 200,000 \end{aligned}$$

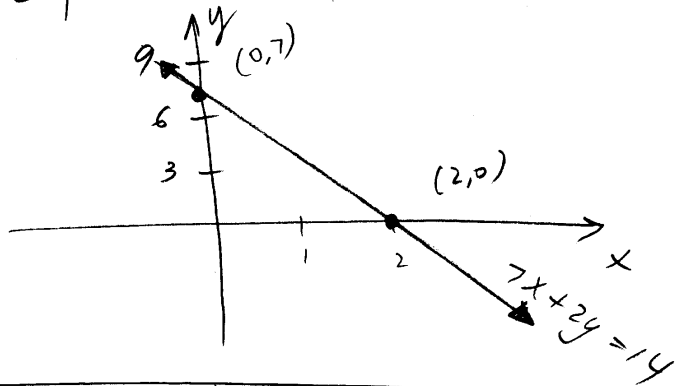
If the company produces and sells 40,000 radios it will make a profit of 200,000 \$

$$\begin{aligned} (8) y &= -0.4x + 38 \\ x &= \# \text{ years after 1980} \\ y &= \% \text{ of men smoking} \end{aligned}$$

$$m = -0.4$$

The percentage of men smoking has decreased at a rate of 0.4% a year since 1980

$$(6) \begin{array}{l} 7x + 2y = 14 \\ x \quad y \end{array}$$



$$(7) (-1, 2)$$

line \perp to $\frac{5}{18}x + \frac{1}{6}y = \frac{2}{3}$

Solution

First, find the slope of the given line

$$\frac{5}{18}x + \frac{1}{6}y = \frac{2}{3}$$

$$\frac{1}{6}y = -\frac{5}{18}x + \frac{2}{3} \quad | \cdot 6$$

$$y = -\frac{5}{3}x + 4$$

$$m = -\frac{5}{3}$$

Then, $m_{\perp} = \frac{3}{5}$ the slope of a line \perp to the given line

$$y - y_1 = m(x - x_1)$$

$$y - 2 = \frac{3}{5}(x - (-1))$$

$$y - 2 = \frac{3}{5}(x + 1)$$