

121-913

HARRY MILLS

SP1.1 #5 5, 9, 11, 15, 19, 23, 27, 29, 33,  
37, 41, 45, 49, 57, 65, 67, 79, 83, 85,  
89, 93, 109, 119

#51-8 Fill in the blank.

(5) An identity is an equation that is satisfied by all real numbers for which the equation is defined

#5 9-12 Determine whether the given # is a solution to the given equation.

(9) 3,  $2x - 4 = 9$  :  
 $2(3) - 4 = 6 - 4 = 2 \neq 9$

No

(11) -3,  $(x - 1)^2 = 16$  :  
 $(-3 - 1)^2 = (-4)^2 = 16$  ✓

Yes

#5 13-26 Solve and check.

(15)  $-3x + 6 = 12$   
 $-3x = 6$   
 $x = \frac{6}{-3} = -2 = x$

✓  
 $-3(-2) + 6$   
 $= 6 + 6 = 12$  ✓

121 § 1.1 #s 19, 23, 27, 29, 33, 37, 41, 45, 49, 57, 65, 67, 79, 83, 85, 89, 93, 109, 119

19  $7 + 3x = 4(x - 1)$

$$3x + 7 = 4x - 4$$

$$-4x - 7 = -4x - 7$$

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$$-x = -11$$

$$x = 11$$

$$\checkmark \quad 7 + 3(11) = 4(11 - 1)$$

$$7 + 33 = 4(10)$$

$$40 = 40 \quad \checkmark$$

23  $\frac{x}{2} - 5 = -12 - \frac{2x}{3}$

$$\frac{x}{2} = -7 - \frac{2x}{3}$$

$$\text{LCD} = 2 \cdot 3 = 6$$

$$\frac{x}{2} \cdot \frac{3}{3} = -7 \cdot \frac{6}{6} - \frac{2x}{3} \cdot \frac{2}{2}$$

$$\frac{3x}{6} = \frac{-42 - 4x}{6}$$

$$3x = -42 - 4x$$

$$+4x = \quad +4x$$

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$$7x = -42$$

$$x = \frac{-42}{7} = -6 = x$$

$$\checkmark \quad -\frac{6}{2} - 5 = -12 - \frac{2(-6)}{3}$$

$$-3 - 5 = -12 + 4$$

$$-8 = -8 \quad \checkmark$$

#s 27-36 Solve and identify each equation as conditional, identity or inconsistent.

5 27, 29, 33, 37, 41, 45, 49, 57, MILLS  
65, 67, 79, 83, 85, 89, 93, 109, 119

oops!

37

$$\frac{1}{w-1} - \frac{1}{2w-2} = \frac{1}{2w-2} \quad D = \{w \mid w \neq 1\}$$

CAN'T DIVIDE BY ZERO:  $w \neq 1$ !  
= Domain

LCD =  $2(w-1)$

$$\frac{1}{w-1} \cdot \frac{2}{2} - \frac{1}{2(w-1)} = \frac{1}{2(w-1)}$$

$$\frac{2-1}{2(w-1)} = \frac{1}{2(w-1)}$$

Identity

IDENTITY. TRUE

$\forall w \in D:$

$\{w \mid w \neq 1\}$

29

$$2x + 3x = 4x$$

$$5x = 4x$$

$$x = 0$$

Conditional

33

$$3(x-6) = 3x+18$$

$$3x-18 = 3x+18$$

$$-3x+18 = -3x+18$$

$$0 = 36?!$$

Inconsistent

No Sol'n

121 §1.1 #s 37, 41, 45, 49, 57, 65, 67, 79, 83, 85, 89,  
93, 109, 119

#s 37-48 Solve Each eq'n involving rational  
expressions (Variables upstairs & / or downstairs)  
Identify as conditional, identity or inconsistent.

<sup>oops!</sup>  
37 Pick up #27, due to blindness

27  $3(x-6) = 3x-18$

$$3x-18 = 3x-18$$
$$-3x+18 = -3x+18$$

---

$$0 = 0$$

Identity

$x \in \mathbb{R}$

See previous page

for #37 I don't EVER do this to teacher!

41  $\frac{z+2}{z-3} = -\frac{5}{3}$  LCD =  $3(z-3)$

$$\left(\frac{z+2}{z-3}\right)\left(\frac{3}{3}\right) = -\left(\frac{5}{3}\right)\left(\frac{z-3}{z-3}\right)$$

$$\frac{3(z+2)}{3(z-3)} = \frac{-5(z-3)}{3(z-3)}$$

$$3z+6 = -5z+15$$

$$8z = 9$$

$$z = \frac{9}{8}$$

conditional

121 § 1.1 #5 45, 49, 57, 65, 67, 79, 83, 85, 84,  
93, 109, 119

(45)  $4 + \frac{6}{y-3} = \frac{2y}{y-3}$

LCD =  $y-3$

$$\left(\frac{4}{1}\right)\left(\frac{y-3}{y-3}\right) + \frac{6}{y-3} = \frac{2y}{y-3}$$

$D = \{y \mid y \neq 3\}$

$$\frac{4y-12+6}{y-3} = \frac{2y}{y-3}$$

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

$$4y-6 = 2y$$

$$2y = 6$$

$$y = 3$$

No Solution!  
Inconsistent!  
 $y = 3 \notin D$  (Problem)

#5 49-62 Solve. Round to 3 decimal places.

(49)  $(.27x - 3.9 = .48x + .29)(100)$

$$\begin{aligned} 27x - 390 &= 48x + 29 \\ -48x + 390 &= -48x + 390 \end{aligned}$$

$$-21x = 419$$

$$x = \frac{419}{-21}$$

$$\approx -19.952 \approx x$$

121  $\S 1.1$  #5 57, 65, 67, 79, 83, 85, 89, 93, 109, 119

(57)  $\frac{x}{.376} + \frac{x}{.135} = 2$

LCD =

$\frac{1000x}{376} + \frac{1000x}{135} = 2$

$$\begin{array}{r} 2 \overline{)376} \\ 2 \overline{)188} \\ 2 \overline{)94} \\ 47 \end{array}$$

$$\begin{array}{r} 3 \overline{)135} \\ 3 \overline{)45} \\ 3 \overline{)15} \\ 5 \end{array}$$

$$\left(\frac{1000x}{376}\right)\left(\frac{135}{135}\right) + \left(\frac{1000x}{135}\right)\left(\frac{376}{376}\right)$$

$$= \left(\frac{2}{1}\right)\left(\frac{(376)(135)}{(376)(135)}\right)$$

DANG! No overlap!

LCD = (376)(135)

$$\frac{135,000x + 376,000x}{LCD} = \frac{101,520}{LCD}$$

$511,000x = 101,520$

$x = \frac{101,520}{511,000} \approx .199 \approx x$

#563-80 Solve each absolute-value equation.

(65)  $|x-4| = 8$

If you do it my way, you'll be better off in § 107.

$x-4 = 8$  OR  $x-4 = -8$   
 $x = 12$  OR  $x = -4$

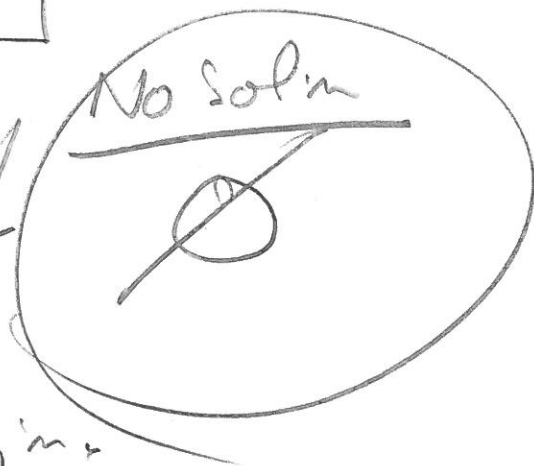
$x \in \{-4, 12\}$

→ Pretty!

121 § 1.1 #s 67, 79, 83, 85, 89, 93, 109, 119

(67)  $|x-6|=0 \rightarrow x=6$   
↑  
special.

(79)  $2|x+7|=6$   
 $2|x+7|=-1$  Never



#s 81-104 Solve each eq'n.

(83)  $(.1x - .05(x-20) = 1.2) (100)$

$$10x - 5(x-20) = 120$$

$$10x - 5x + 100 = 120$$

$$5x + 100 = 120$$

$$5x = 20$$

$$x = 4$$

Solution set answer.  
 $x \in \{4\}$

(85)  $(x+2)^2 = x^2 + 4$   
 $x^2 + 4x + 4 = x^2 + 4$

$$4x + 4 = 4$$

$$4x = 0$$

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

Solution set.

$$x \in \{0\}$$

121  $\mathcal{P} 1.1 \#s 89, 93, 109, 119$

(89)  $\frac{x}{2} + 1 = \frac{1}{4}(x-6)$

$$\frac{x}{2} + 1 = \frac{x}{4} - \frac{6}{4} \quad \text{LCD} = 4 = 2 \cdot 2$$

$$\frac{x}{2} \cdot \frac{2}{2} + \frac{1}{1} \cdot \frac{4}{4} = \frac{x-6}{4}$$

$$\frac{2x+4}{\text{LCD}} = \frac{x-6}{\text{LCD}}$$

$$2x+4 = x-6$$

$$x = -10$$

$$x \in \{-10\}$$

(93)  $5 + 7|x+6| = 19$

$$7|x+6| = 14$$

$$|x+6| = \frac{14}{7} = 2$$

$$x+6 = 2 \quad \text{OR} \quad x+6 = -2$$

$$x = -4 \quad \text{OR} \quad x = -8$$

$$x \in \{-8, -4\}$$



121 §1.1 #s 109, 119

109

A car manufacturer spent \$500 million to develop a new car line. He wants the cost of development per car to be \$12,000. If production costs are \$10,000/car, then the cost per car for development and production is  $\frac{10,000x + 500,000,000}{x}$  dollars.

$$= \frac{\$}{x} = 12,000$$

The \$500 million is the FIXED COST in \$  
 $\frac{\$10,000}{\text{car}}$  is marginal cost in  $\frac{\$}{\text{car}}$ .

Find the # of cars needed so that cost of production + development is

$$\frac{\$12,000}{\text{car}}$$

$x = \# \text{ of cars produced}$

$$\frac{10,000x + (5)(10^8)}{x}$$

$$\text{LCD} = x$$

$$= \frac{12000}{1} \cdot \frac{x}{x}$$

$$10,000x + (5)(10^8) = 12000x$$

$$-2000x = -5(10^8)$$

$$x = \frac{5(10^8)}{2000} = \frac{5(10^8)}{2(10^3)} = \left(\frac{5}{2}\right)(10^5) = x$$

$$250,000 \text{ cars} = x$$

121 §1.1 #5 119

(119) write  $\sqrt{\frac{5}{3}}$  in simplified radical form?

form?

$$\begin{aligned}\sqrt{\frac{5}{3}} &= \frac{\sqrt{5}}{\sqrt{3}} = \frac{\sqrt{5}}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{5}\sqrt{3}}{\sqrt{3}\sqrt{3}} \\ &= \frac{\sqrt{15}}{\sqrt{9}} = \boxed{\frac{\sqrt{15}}{3}}\end{aligned}$$