

## Math 172 – Quiz #2

October 18, 2013

Name: Solution Set

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Total: 40 points

1. Find the solution set of each equation and state whether the equation is conditional, inconsistent, or an identity. (12 points)

a)  $(5x+2) - 2(3-x) = 7x-4$

$$5x+2 - 6 + 2x = 7x-4$$

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

R

identity

b)  $0.2(50-x) = -10(0.02x+1)$

$$10 - 0.2x = -0.2x - 10$$

$$10 = -10$$

$\emptyset$

inconsistent

$\frac{50}{0.2}$   
 $\frac{0.2}{100}$

$\frac{2}{10} (50) = 10$

c)  $\left( \frac{2x-1}{5} - \frac{x-8}{6} \right) = \left( \frac{2}{3} \right) \times 30$

$$6(2x-1) - 5(x-8) = 20$$

$$12x - 6 - 5x + 40 = 20$$

$$7x = -20 + 6$$

$$7x = -14$$

$$x = -2$$

$\{-2\}$

conditional

2. Solve the following equations for  $y$ .

(5 points)

a)  $0 = y + 3m - 5my$

$$y = \frac{3m}{5m-1}$$

$$5my - y = 3m$$

$$y(5m-1) = 3m$$

$$y = \frac{3m}{5m-1}$$

or  $y = \frac{-3m}{1-5m}$

b)  $\left(\frac{1}{5m} + \frac{1}{2y}\right) = (4) \cdot 10my$

$$y = \frac{5m}{40m-2}$$

$$2y + 5m = 40my$$

$$5m = 40my - 2y$$

$$5m = y(40m-2)$$

$$y = \frac{5m}{40m-2}$$

or  $y = \frac{-5m}{2-40m}$

3. Solve the following absolute value equations.

(4 points)

a)  $|x-5| = |4-2x|$

$$\underline{\{-1, 3\}}$$

$$x-5 = 4-2x$$

or

$$x-5 = -(4-2x)$$

$$3x = 9$$

$$x = 3$$

$$x-5 = -4+2x$$

$$-1 = x$$

b)  $4 + |4-x| = 3$

$$|4-x| = -1$$

$$\underline{\emptyset}$$

4. Solve the following inequalities, state the solution set in interval notation, and graph it. (10 points)

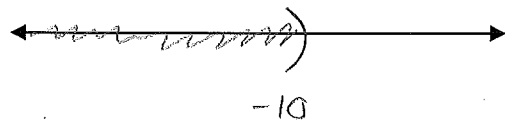
a)  $\frac{3x+2}{-4} > 7$

$(-\infty, -10)$

$$3x+2 < -28$$

$$3x < -30$$

$$x < -10$$



b)  $3 < 5 - 2(x-1) \leq 13$

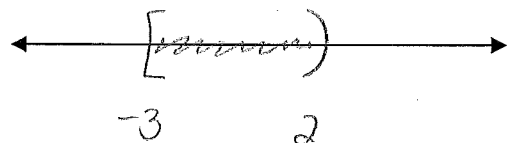
$[-3, 2)$

$$-2 < -2(x-1) \leq 8$$

$$1 > x-1 \geq -4$$

$$2 > x \geq -3$$

$$-3 \leq x < 2$$



c)  $9 + 3(4-x) \geq 0$  and  $4-x \leq x$

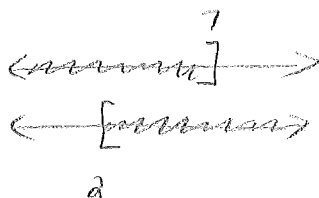
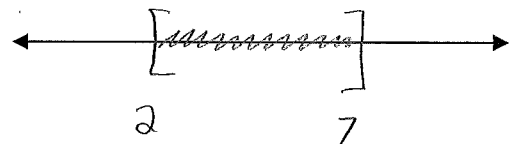
$[2, 7]$

$$3(4-x) \geq -9 \quad \text{and} \quad 4-x \leq x$$

$$4-x \geq -3 \quad 4 \leq 2x$$

$$7 \geq x \quad 2 \leq x$$

$$x \leq 7 \quad x \geq 2$$



5. Two integers have a sum of 27 and the second integer is 5 less than three times the first. What are the two integers? (3 points)

$$\text{let } x = \text{first integer}$$

$$3x - 5 = \text{second integer}$$

$$x + (3x - 5) = 27$$

$$4x = 32$$

$$x = 8$$

The two integers are 8 and 19.

6. Pat has just bought some milk that is 2% fat. She would like to add a certain amount of milk that is 10% fat in order to get a total of eight litres of milk that is 4% fat. How much of the 10% fat milk must she add? (6 points)

	amount fat	=	% fat	amount milk
2%	$0.02m$		0.02	$m$
	+			
10%	$0.1(8-m)$		0.1	$8-m$
	=			
4%	$0.04(8)$		0.04	8

$$0.02m + 0.1(8-m) = 0.04(8)$$

$$0.02m + 0.8 - 0.1m = 0.32$$

$$0.48 = 0.08m$$

$$48 = 8m$$

$$m = 6$$

Pat must add 2 litres of 10% milk.