# Math 172 – Quiz #2

**October 18, 2013** **Name:** _____

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

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

$7x-4=7x-4$

$(-\infty,\infty)$ or $\mathbb{R}$

identity

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

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

$10=-10$

$\emptyset$

inconsistent

c) $\frac{2x-1}{5}-\frac{x-8}{6}=\frac{2}{3}$

LCD = 30

$\overset{6}{\cancel{30}}\cdot\frac{(2x-1)}{\cancel{5}}-\overset{5}{\cancel{30}}\cdot\frac{(x-8)}{\cancel{6}}=\overset{10}{\cancel{30}}\cdot\frac{2}{\cancel{3}}$

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

$7x+34=20$

$7x=-14$

$x=-2$

$\{-2\}$

Conditional

2. Solve the following equations for $y$. (5 points)

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

$-3m = y - 5my$

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

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

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

b) $\frac{1}{5m} + \frac{1}{2y} = 4$

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

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

$2y + 5m = 40my$

$2y - 40my = -5m$

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

3. Solve the following absolute value equations. (4 points)

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

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

$3x = 9$ $\quad$ $x-5 = -4+2x$

$x = 3$ $\quad$ $-1 = x$

$\{-1, 3\}$

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

$|4-x| = -1$

no solution

$\emptyset$

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

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

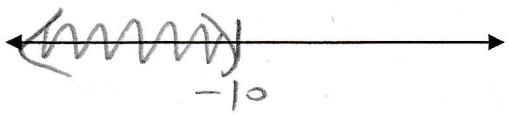
$3x+2 < -28$

$3x < -30$

$x < -10$

(1)

$(-\infty, -10)$

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

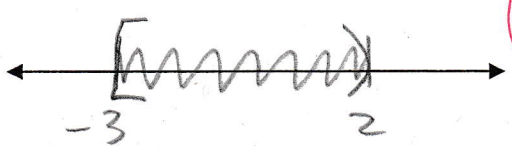
$-2 < -2(x-1) \leq 8$

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

$2 > x \geq -3$

(1)

$[-3, 2)$

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

$3(4-x) \geq -9$

$4-x \geq -3$

$7 \geq x$

Same as $x \leq 7$.

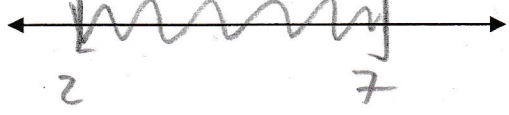
$4 \leq 2x$

$2 \leq x$

Same as $x \geq 2$

(2)

$[2, 7]$

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OR $\cup$

AND $\cap$

Note: graphs must be clearly shown on the number line.

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)

(1) Let $x$ = 1st integer

$3x-5$ = 2nd integer

(1)
$$x + 3x - 5 = 27$$
$$4x - 5 = 27$$
$$4x = 32$$
$$x = 8$$

$$3x-5 = 3(8)-5 = 19$$

(1) The 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)

(2) Let $x$ = volume of 10% fat milk

$8-x$ = " 2% "

| | $V_{milk}$ | % | $V_{fat}$ |
|---|---|---|---|
| 10% | $x$ | 0.1 | $0.1x$ |
| 2% | $8-x$ | 0.02 | $0.02(8-x)$ |
| 4% | 8 | 0.04 | $0.04(8)$ |

(2)
$$0.1x + 0.02(8-x) = 0.04(8)$$
$$0.1x + 0.16 - 0.02x = 0.32$$
$$0.08x = 0.16$$

(1)
$$x = \frac{0.16}{0.08} = \frac{16}{8} = 2$$

(1) She must add 2 L of 10% milk.