King Fahd University of Petroleum and Minerals
Dammam Community College

MATH 011 **CODE A**

Class Test 2

Term 162
April 10, 2017

Name: Marking Scheme **ID #** _____ **Sec #** xy.

This test consists of 8 questions.

Time allowed. **60 minutes.**

You must show all necessary steps of your solution.

Calculators are not allowed.

This test worth 8% of the total marks allocated to this course.

Question	Points
Q#1	/4
Q#2	/4
Q#3	/4
Q#4	/4
Q#5	/4
Q#6	/4
Q#7	/4
Q#8	/4
Total points =	/32

Question 1: If the equation $-2(y-3) + 2(\frac{5}{3}y + 2) = by + 10$ is an Identity. **Find 3 *b***

$$-2(y-3) + 2\left(\frac{5}{3}y + 2\right) = by + 10$$

1.5 pt

$$-2y + 6 + \frac{10}{3}y + 4 = by + 10$$

$$-6y + 18 + 10y + 12 = 3by + 30 \quad \times 3$$

1.5 pt

$$4y + 30 = 3by + 30$$

$$4y = 3by$$

..... Equation is an identity.

$$\therefore \boxed{3b = 4}$$

1pt

Question 2: If $x = -2$ is a solution of the equation $\frac{x+5}{6} = \frac{1}{12}(kx + 2)$. **Find *k***

$$12\left(\frac{x+5}{6}\right) = 12 \cdot \frac{1}{12}(kx + 2)$$

1pt

$$2(x+5) = kx + 2$$

1pt

$$2x + 10 = kx + 2$$

1pt

$x = -2$ is a solution

$$2(-2) + 10 = k(-2) + 2$$

$$6 = -2k + 2$$

$$4 = -2k, \quad k = -2$$

1pt

Question 3: If $2y^2 + 12y + 17 = 0$ is written in the complete square form as $(y-a)^2 = b$. **Find $a + b$**

$$2y^2 + 12y + 17 = 0$$

$\div 2$ $\quad y^2 + 6y + \frac{17}{2} = 0$ 0.5 pt

$$y^2 + 6y + 9 = -\frac{17}{2} + 9$$ 1pt

$$(y+3)^2 = -\frac{17}{2} + \frac{18}{2}$$ 1pt

$(y+3)^2 = \frac{1}{2}$, $a = -3$, $a+b = -3 + \frac{1}{2}$

$(y-a)^2 = b$, $b = \frac{1}{2}$ $\quad a+b = -\frac{5}{2}$ 1pt

0.5 pt

Question 4: If $x = c$ is the solution of $\frac{2x-1}{x-2} + \frac{2x+1}{x} = \frac{-3}{x^2-2x}$. **Find $2c - 2$.**

$$\frac{2x-1}{x-2} + \frac{2x+1}{x} = \frac{-3}{x(x-2)}, \quad x \neq 0, x \neq 2.$$

Lcd $((x-2), x, x(x-2)) = x(x-2)$ 1.5 pt

Multiply both sides by the Lcd.

$$x(x-2)\left(\frac{2x-1}{x-2} + \frac{2x+1}{x}\right) = x(x-2)\left(\frac{-3}{x(x-2)}\right)$$

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

$$2x^2 - x + 2x^2 + x - 4x - 2 + 3 = 0$$

$$4x^2 - 4x + 1 = 0$$

$(2x-1)^2 = 0 \longrightarrow x = \frac{1}{2}$ $\quad \begin{cases} x = \frac{1}{2} \in \text{Domain of Solution} \\ x \neq 0, x \neq 2 \end{cases}$

One double Solution.

1.5 pt

$x = c = \frac{1}{2}$

$\therefore 2c - 2 = 2\left(\frac{1}{2}\right) - 2 = 1 - 2 = -1$

Question 5: Find solution set of the inequality $\frac{y}{y-2} \geq \frac{-1}{y-2}$.

$$\frac{y}{y-2} + \frac{1}{y-2} \geq 0$$ 1

1 $$\frac{y+1}{y-2} \geq 0 \longrightarrow \begin{array}{l} y+1=0, \quad y=-1 \\ y-2=0, \quad y=2 \end{array}$$

		-1	2
$\frac{y+1}{y-2} \geq 0$	$y=-2$ $\frac{-1}{-4} \geq 0$ True ✓	$y=0$ $\frac{1}{-2} \geq 0$ False ✗	$y=3$ $\frac{4}{1} \geq 0$ TRUE ✓

1pt

, Solution set $= (-\infty, -1] \cup (2, \infty)$

1pt

Question 6: Solve the equation $|x+1|^2 - |x+1| = 6$.

$$|x+1|^2 - |x+1| = 6$$

$$|x+1|^2 - |x+1| - 6 = 0$$ 1pt

let: $y = |x+1|$, $y^2 = |x+1|^2$

$$y^2 - y - 6 = 0$$

$$(y+2)(y-3) = 0 \longrightarrow \begin{cases} y=-2 \\ y=3 \end{cases}$$ 1pt

$y = -2$

$|x+1| = -2$

No x can satisfy This

1pt

, $y = 3$

$|x+1| = 3 \iff \begin{cases} x+1=3 \\ \text{or} \\ x+1=-3 \end{cases} \rightarrow \begin{cases} x=2 \\ \text{or} \\ x=-4. \end{cases}$

The Solution Set $= \{-4, 2\}$.

1pt

Question 7: solve the inequality and write the solution in interval notation:

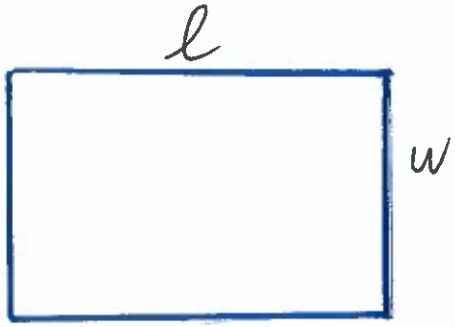
$$|y-1| \leq 3$$

$|y-1| \leq 3 \iff -3 \leq y-1 \leq 3$ .... 2 pr

$$\left.\begin{aligned} -3+1 &\leq y \leq 3+1 \\ -2 &\leq y \leq 4 \end{aligned}\right\} \text{1 pr}$$

The Solution set $= [-2, 4]$ .... 1 pr

Question 8: If the length of a rectangle is 2 m less than twice the width. The Perimeter is 32m. Find the length.



1.5 pr

$l = 2w - 2$

$P = 2(l+w) = 2l + 2w = 2(2w-2) + 2w$

$P = 6w - 4$

$32 = 6w - 4 \longrightarrow 36 = 6w$

$w = 6$ cm , $l = 2w - 2$

$l = 2(6) - 2$

$l = 10$ cm.

1.5 pr

1 pr