



**Department of Mathematics  
Moreno Valley College**

**Mathematics 52  
Course ID: (27488)  
Second Take-Home Midterm  
Fall 2016**

**Dates: November 15<sup>th</sup>, 2016 and November 16<sup>th</sup>, 2016  
Times: 8:00 AM – 10:05 AM and 2:00 PM – 4:05 PM**

**Professor: Mohammed Kaabar**

<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>P4</b>	<b>P5</b>	<b>P6</b>	<b>P7</b>	<b>P8</b>	<b>P9</b>	<b>EC</b>	<b>Total</b>
<b>20</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>5</b>	<b>100</b>

**Student Name:.....**

**Student ID:.....**

**Exam Instructions:**

- 1- This exam has 8 questions and two extra credit questions.
- 2- Make sure you answer all questions.
- 3- Cheating = “F”
- 4- Make sure to include this page in your submission materials.

**Student Signature:.....**

**Problem 1 (20 points):** Determine whether the following is **TRUE** or **FALSE** and if it is false **EXPLAIN** why:

- a. Linear inequality is a mathematical statement that has a mathematical expression that is greater than only.
- b. The solution for  $-5 + 7x < 3x + 7$  is  $3 > x$ .
- c. The solution for  $\left(\frac{4z+5}{2} - \frac{1}{3}\right) \geq \left(-\frac{7}{2} + z\right)$  is  $z \leq -\frac{34}{6}$ .
- d. The general form of the interval notation can be written as  $\{variable|solution\}$ .
- e.  $(0,2)$  is located on the first quadrant only.
- f.  $(-1,2)$  is located on the second quadrant.
- g. Given that  $l_1$  and  $l_2$  are non-vertical lines. If  $l_1 \parallel l_2$ , then  $m_1 + m_2 = -1$ .
- h. Given that  $l_1$  and  $l_2$  are non-vertical lines. If  $l_1$  and  $l_2$  make an angle of  $90^\circ$ , then  $m_1 \cdot m_2 = -1$ .
- i. It is impossible to derive the slope-point form of equation of line using the slope formula by considering the slope passes through  $(x_1, y_1)$  and  $(x, y)$ .
- j.  $y - intercept$  is defined as a point on the  $y - axis$  that is considered the passing point for the graph of equation:  $y = mx + b$  so the  $y - intercept$  is  $(b, 0)$ .

**Problem 2 (10 points):** Answer each of the following:

a. What is the name of zero slope? -----

b. What is the name of undefined slope? -----

c. What is the positive slope? -----

d. Draw the positive slope:

e. What is the negative slope? -----

f. Draw the negative slope:

g. Derive the point-slope form of the equation of line:

Hint: Use  $(x_1, y_1)$  and  $(x, y)$  as two given points and write the slope formula  $m = \frac{(y_2 - y_1)}{(x_2 - x_1)}$

**Problem 3 (10 points):** In our class, we talked about two theorems of lines: vertical line and horizontal line. Discuss those two theorems and make sure to include examples and graphs for both lines.

Hint: Use “Slope of a Line” lecture notes.

**Problem 4 (10 points):** In our class, we talked about two theorems of non-vertical lines:

Discuss those two theorems and make sure to include examples and graphs for both non-vertical lines.

Hint: Use “Slope of a Line” lecture notes.

**Problem 5 (10 points):** Solve **TWO** of the following **FIVE** problems:

- 1- Solve for  $x$  given that  $|-2x + 2| = 3$ .
- 2- Solve for  $x$  given that  $|5x + 12| \geq 6$ .
- 3- A line passes through  $(2, -1)$  and it is perpendicular to another line:  
 $2y + 3 - 5y = -2x + 5x$ . Write the equation for this line.
- 4- Solve the following linear inequality:

$$15\beta + \sqrt[3]{8} < (-6766776.766)^0 + 2\beta$$

- 5- Solve the following linear inequality:

$$-2\beta + 1^{\sqrt[3]{8}} < \left( -\frac{-23433.63}{-343544.12} \right)^0 + 12\beta$$



**Problem 7 (10 points):** Use either long division or synthetic division to do the following:

$$\frac{x^3 + x^2 - x - 1}{x - 3}$$



**Problem 8 (10 points):** Factor each of the following:

a.  $(x^2 - 12)$

b.  $(x - 25)$

c.  $(16a^2 - 48ac + 36c^2 - 100)$

d.  $(25x^2 - 16)$

e.  $(24z^2 - 12)$

**Problem 9 (10 points):** Simplify each of the following:

a.  $(2x - 1)^2$

b.  $x^3y^{-1}z^2m^2ym^{-2}x^{-2}$

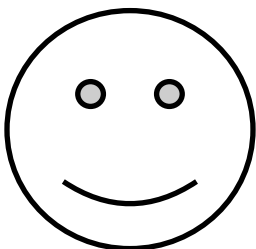
c.  $\left(-\frac{x^3}{3y^2x^7}\right)^3$

d.  $(x^2 + 1)^2$

e.  $7y^2x^3(-3x^{-3}y^{-5})$

**Extra Credit Problem (5 points):** Use only synthetic division to do the following:

$$\frac{x^3 + x^2 - x - 1}{2x^2 - x + 2}$$



I wish you best of luck in Exam 2  
Best Regards  
Professor: Mohammed Kaabar

