

Math 172-Quiz # 3

2015

Name: _____

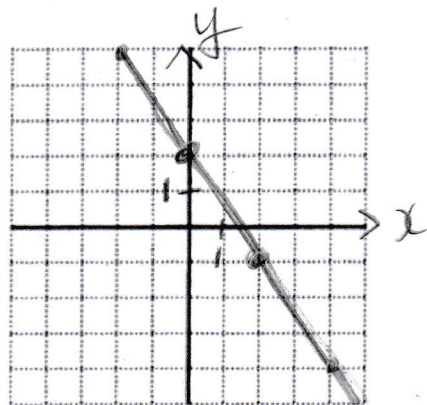
Total: 40 Points

1. [5 points] Find the slope and the y -intercept of the line $3x + 2y - 4 = 0$ and use these to graph the line.

②

$$2y = -3x + 4$$

$$y = -\frac{3}{2}x + 2$$



②

slope: $\frac{-3}{2}$

y -intercept: 2 or $(0, 2)$

2. [5 points] Line l_1 has equation $4x - 5y = 6$. Find the equation of the line l_2 which passes through the point $(-1, 4)$ and is parallel to l_1 . Write the equation in standard form with integral coefficients, and also in slope-intercept form.

①

slope of l_1 : $-5y = -4x + 6$

$$y = \frac{4}{5}x - \frac{6}{5}$$

②

$$4x - 5y = -24$$

$$y = \frac{4}{5}x + \frac{24}{5}$$

slope of $l_1 = \frac{4}{5}$

①

slope of $l_2 = \frac{4}{5}$ (parallel lines)

l_2 : $y - y_1 = m(x - x_1)$

$y - 4 = \frac{4}{5}(x + 1)$

$y - 4 = \frac{4}{5}x + \frac{4}{5}$

$y = \frac{4}{5}x + \frac{4}{5} + 4 \frac{20}{5}$

②

$$y = \frac{4}{5}x + \frac{24}{5}$$

$$5y = 4x + 24$$

$$-24 = 4x - 5y$$

3. [2 points] What is the slope of the following lines?
(No explanation required).

$x = -2$

vertical line

undefined

$y = 3$

horizontal line

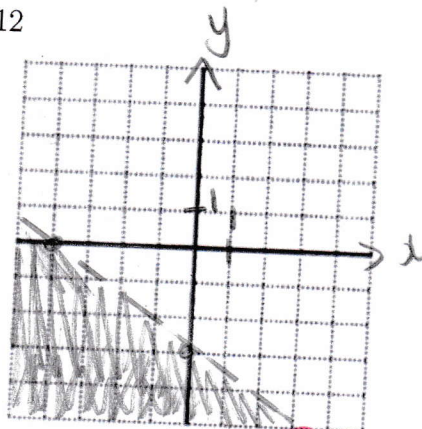
0

4. [5 points] Graph the inequality $3x + 4y < -12$

② Points : $(0, -3)$
 $(-4, 0)$

↑
dotted
line

Test $(0, 0)$: $0 < -12$ FALSE



① shading ② line

5. [5 points] Graph the compound inequality $x + 2y > 2$ or $-y \geq 1$

$x + 2y = 2$:

$(0, 1)$

$(2, 0)$

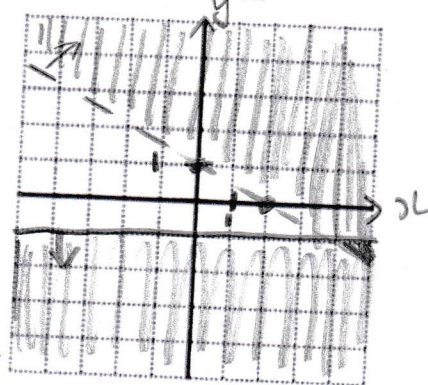
Test $(0, 0)$: $0 > 2$
FALSE

$-y = 1$:

$y = -1$

horizontal line

Test $(0, 0)$: $0 \geq 1$
FALSE



OR: take the union
② for each line
① shading

6. [12 points] Solve the following systems of equations. You may use any method, but show all your work. State the solution set, and say whether the system is independent, dependent or inconsistent.

$$\begin{aligned} \text{a) } 7x - 11y &= -53 & \textcircled{1} \\ x &= 2y - 11 & \textcircled{2} \end{aligned}$$

$$\frac{\{(5, 8)\}}{\text{independent}} \quad \textcircled{2}$$

$$\begin{aligned} \textcircled{2} \rightarrow \textcircled{1}: & \quad 7(2y - 11) - 11y = -53 \\ & \quad 14y - 77 - 11y = -53 \\ & \quad 3y - 77 = -53 \\ & \quad 3y = 24 \\ & \quad y = 8 \quad \textcircled{2} \end{aligned}$$

$$\begin{aligned} y = 8 \rightarrow \textcircled{2}: & \quad x = 2(8) - 11 \\ & \quad x = 5 \end{aligned}$$

$$\begin{aligned} \text{b) } 2x - 5y &= 2 & \textcircled{1} \\ -4x + 10y &= 3 & \textcircled{2} \end{aligned}$$

$$\frac{\emptyset \text{ or no solution}}{\text{inconsistent}} \quad \textcircled{2}$$

$$\begin{aligned} 2 \times \textcircled{1}: & \quad 4x - 10y = 4 & \textcircled{1} \\ \textcircled{2}: & \quad -4x + 10y = 3 & \textcircled{1} \\ + & \quad \hline & \quad 0 = 7 & \textcircled{1} \end{aligned}$$

$$c) \quad \frac{1}{2}x - \frac{1}{3}y = -3 \quad (1)$$

$$0.2x + 0.1y = 0.2 \quad (2)$$

$\{-2, 6\}$
independent

$$6 \times (1): \quad 3x - 2y = -18 \quad (3)$$

$$10 \times (2): \quad 2x + y = 2 \quad (4)$$

$$(3): \quad 3x - 2y = -18$$

$$2 \times (4): \quad + \quad \underline{4x + 2y = 4}$$

$$7x = -14$$

$$x = -2$$

$$x = -2 \rightarrow (4): \quad 2(-2) + y = 2$$

$$-4 + y = 2$$

$$y = 6$$

7. [6 points] Admission to Sunny's Cinema costs \$28 total for 2 adults and 2 children, \$27 total for 3 children and 2 seniors, and \$20 total for 1 adult, 1 child and 1 senior. How much does each type of admission (adult, child, senior) cost? Show all your work.

let $A =$ cost for an adult (\$)
 $C =$ " a child (\$)
 $S =$ " a senior (\$)

$$\begin{cases} 2A + 2C = 28 & (1) \\ 3C + 2S = 27 & (2) \\ A + C + S = 20 & (3) \end{cases}$$

$$(1): \quad 2A + 2C = 28$$

$$-2 \times (3) \quad + \quad \underline{-2A - 2C - 2S = -40}$$

$$-2S = -12$$

$$S = 6$$

$$S = 6 \rightarrow (2): \quad 3C + 2(6) = 27$$

$$3C = 15$$

$$C = 5$$

$$C = 5 \rightarrow (1): \quad 2A + 2(5) = 28$$

$$2A = 18$$

$$A = 9$$

Adults cost \$9
Children cost \$5
Seniors cost \$6