

Math 135 – Test 4: Version B

April 7, 2019

Name: Solution Set

Instructor: Patricia Wrean

Allowed calculators: Sharp EL 531 and the TI BAIL.

Total: 25 points

Part I: For these short-answer questions, you do not need to show any work. Place your final answer in the space provided. Each answer is worth one point.

1. (4 points) Consider the line given by the equation $4x + y = 8$.

(a) Write the equation in slope-intercept form..

$$y = -4x + 8$$

$$\underline{y = -4x + 8}$$

(b) Find the slope of the line.

$$\underline{m = -4}$$

(c) Find the y -intercept of the line.

$$\underline{(0, 8) \text{ or } b = 8}$$

(d) Find the x -intercept of the line.

$$\begin{aligned} \text{let } y = 0: \quad 4x + 0 &= 8 \\ x &= 2 \end{aligned}$$

$$\underline{(2, 0) \text{ or } 2}$$

2. (2 points) If $f(x) = \frac{1}{3}x + 1$, find the following. Simplify your answer.

$$\begin{aligned} \text{(a) } f(-3) &= \frac{1}{3}(-3) + 1 \\ &= -1 + 1 = 0 \end{aligned}$$

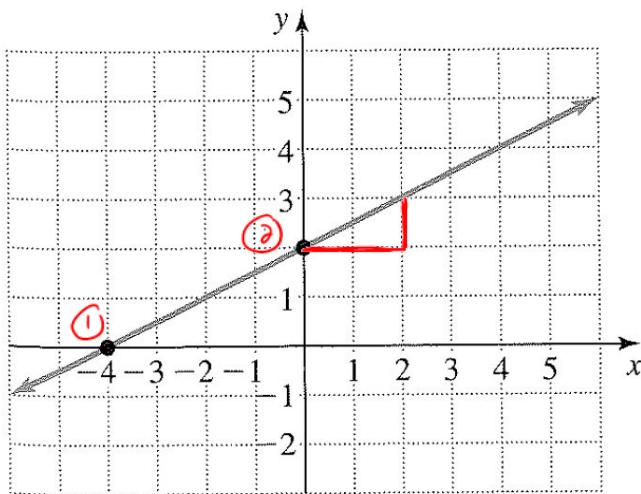
$$\underline{0}$$

$$\begin{aligned} \text{(b) } f(2) &= \frac{1}{3}(2) + 1 \\ &= \frac{2}{3} + 1 = \frac{5}{3} \end{aligned}$$

$$\underline{\frac{5}{3}}$$

Part II: For these questions, show your work and either write your final answer in the space provided or graph your answer on the grid.

3. (4 points) For the graph below, state the equation of the line and also the coordinates of the x - and y -intercepts.



equation of line: $y = \frac{1}{2}x + 2$

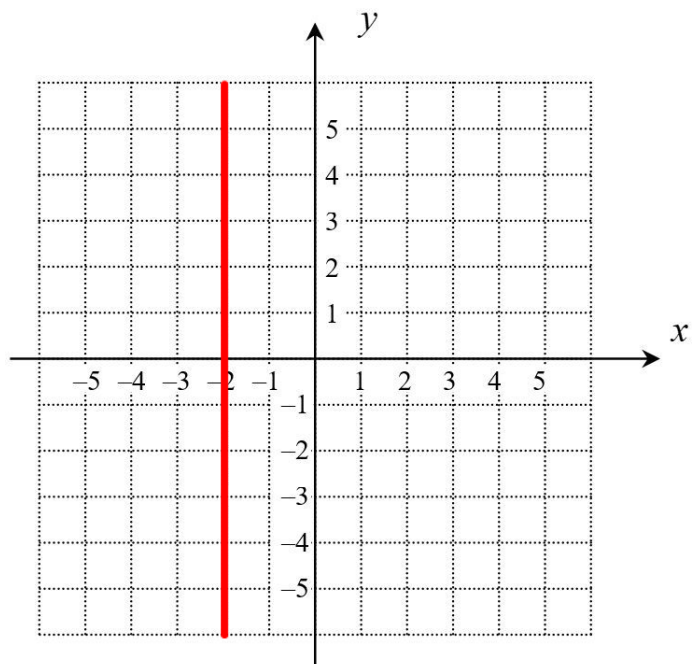
x -intercept: $(-4, 0)$ or -4

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

$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{1}{2}$$

$$\text{or } m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{2 - 0}{0 - (-4)} = \frac{2}{4} = \frac{1}{2}$$

4. (2 points) Graph the line $x = -2$ on the grid below.



5. (3 points) Find the equation of the line that has a slope of -2 and passes through the point $(1, -5)$. Write your answer in slope-intercept form.

$$y = mx + b$$

$$y = -2x + b$$

sub in $(1, -5)$:

$$-5 = -2(1) + b$$

$$-5 = -2 + b$$

$$-3 = b$$

$$\text{So } y = -2x + b$$

$$y = -2x - 3$$

$$\underline{y = -2x - 3}$$

6. (3 points) A straight line passes through the points $(1, 3)$ and $(2, -3)$.

(a) Calculate the slope of this line.

$$\begin{aligned} m &= \frac{y_2 - y_1}{x_2 - x_1} \\ &= \frac{-3 - 3}{2 - 1} \\ &= \frac{-6}{1} = -6 \end{aligned}$$

①

②

$$\underline{m = -6}$$

(b) Calculate the slope of a line perpendicular to this line.

$$m_2 = -\frac{1}{m_1} = \frac{-1}{-6} = \frac{1}{6}$$

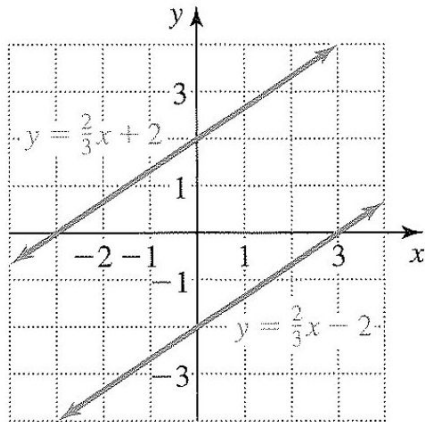
$$\underline{\frac{1}{6}}$$

7. (2 points) Consider the relation $\{(-2, 5), (3, 7), (-1, 2), (0, 7)\}$. Is this relation a function? Explain briefly.

yes, because for every x-value there is only one y-value

8. (1 point) A system of equations has been graphed on the grid below. How many solutions does the system have?

number of solutions: none



lines are parallel and do not intersect

9. (4 points) Solve the following system of equations.

$$\begin{cases} y = -2x + 1 & \textcircled{1} \\ x - y = 2 & \textcircled{2} \end{cases}$$

(1, -1)

$$\begin{aligned} \textcircled{2} \quad x - y &= 2 \\ -y &= -x + 2 \\ y &= x - 2 \end{aligned}$$

