MATH 102, Spring 2023 In class work 2

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Name: _______Row and Seat:______

In class work 2 has questions 1 through 2 with a total of 7 points. This assignment is due at the end of the class period (9:55 AM).

- 1. A line *L* contains the points (x = 5, y = 2) and (x = 7, y = -1).
 - (a) Find an *equation* of the line *L*.

Solution: The slope of the line L is

$$\frac{2 - (-1)}{5 - 7} = -\frac{3}{2}$$

An equation of the line L is

$$y - 2 = -\frac{3}{2}(x - 5).$$

Using the other point, we get a syntactically different equation-it is

$$y+1 = -\frac{3}{2}(x-7).$$

A good way to check an equation of a line is to paste the data in to the equation and see if it is true. Pasting (x = 5, y = 2) into our first equation for L, we have

$$\left[2-2=-\frac{3}{2}(5-5)\right]=[0=0]=$$
True.

And pasting in (x = 7, y = -1), we have

$$\left[-1-2=-\frac{3}{2}(7-5)\right]=[-3=-3]=$$
True.

Similarly, you should check that the equation $y + 1 = -\frac{3}{2}(x - 7)$ is also correct. The question *doesn't* ask for a particular form for the equation of the line, but converting to a slope-intercept form, we have

$$y = -\frac{3}{2}x + \frac{19}{2}.$$

(b) Find the *x-intercept* of the line *L*.

Solution: To find the x-intercept of the line $y-2=-\frac{3}{2}(x-5)$, set y to zero and solve for x; we have

$$\left[0-2=-\frac{3}{2}(x-5)\right] = \left[\frac{4}{3} = x-5\right],$$
$$= \left[x = \frac{19}{3}\right]$$

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

Solution: To find the y-intercept of the line $y-2=-\frac{3}{2}(x-5)$, set x to zero and solve for y; we have

$$\left[y-2 = -\frac{3}{2}(0-5)\right] = \left[y-2 = \frac{15}{2}\right]$$
$$= \left[y = \frac{19}{2}\right]$$

- 2. An equation of a line *L* is 2y + 3x = 6.
- $\boxed{1}$ (a) Find the *slope* of the line L.

Solution: To find the slope of the line 2y + 3x = 6, we solve 2y + 3x = 6 for y and match to the slope-intercept form y = mx + b (the slope being m). Solving 2y + 3x = 6 for y gives $y = -\frac{3}{2}x + 3$. And matching this to y = mx + b gives $m = -\frac{3}{2}$.

(b) Find the x-intercept of the line L.

Solution: We have

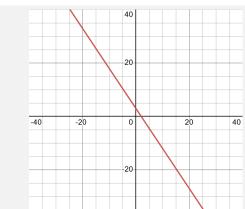
$$[3x = 6] = [x = 2].$$

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

Solution: We have

$$[2y = 6] = [y = 3].$$

 $\boxed{1}$ (d) Draw a graph of the line L.



Solution: