MATH 102, Spring 2023 **Name:** _____
In class work 2 **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 $(x = 7, y = -1)$.

[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

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

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

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

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

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

[1] (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

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

1 (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

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

2. An equation of a line L is $2y+3x=6$.

[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 $m=-\frac{3}{2}$.

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

Solution: We have

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

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

Solution: We have

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

[1] (d) Draw a graph of the line L.

Solution: