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

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

Using the point $(x=5, y=2)$ in the point-slope formula, an equation of the line is

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

Using the other point, gives an equation that looks different, but describes exactly the same line.

A good way to check our work is to paste the data in to the equation and see if it is true. Pasting $(x=5, y=2)$ into our 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

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

The question doesn't ask for a particular form for the equation of the line. We've found a point slope form for the line and we have checked our work. What should we do now? We should LIB (let it be). If the question asked for the slope-intercept form, we would need to give the answer as

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

But the question gives us the *freedom* to give either form for the equation of the line. **Let's exercise our freedom and do so.**

[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

$$\left[0-2=-\frac{3}{2}(x-5)\right]=\left[\frac{4}{3}=x-5\right], \qquad \text{(multiply by } -2/3\text{)}$$
$$=\left[x=\frac{19}{3}\right]. \qquad \text{(add 5)}$$

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

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

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

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: In the equation $2y+3x=6$, set y to zero and solve for x; we have

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

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

Solution: In the equation $2y+3x=6$, set x to zero and solve for y; we have

$$\left[2y=6\right]=\left[y=3\right].$$

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

Solution: