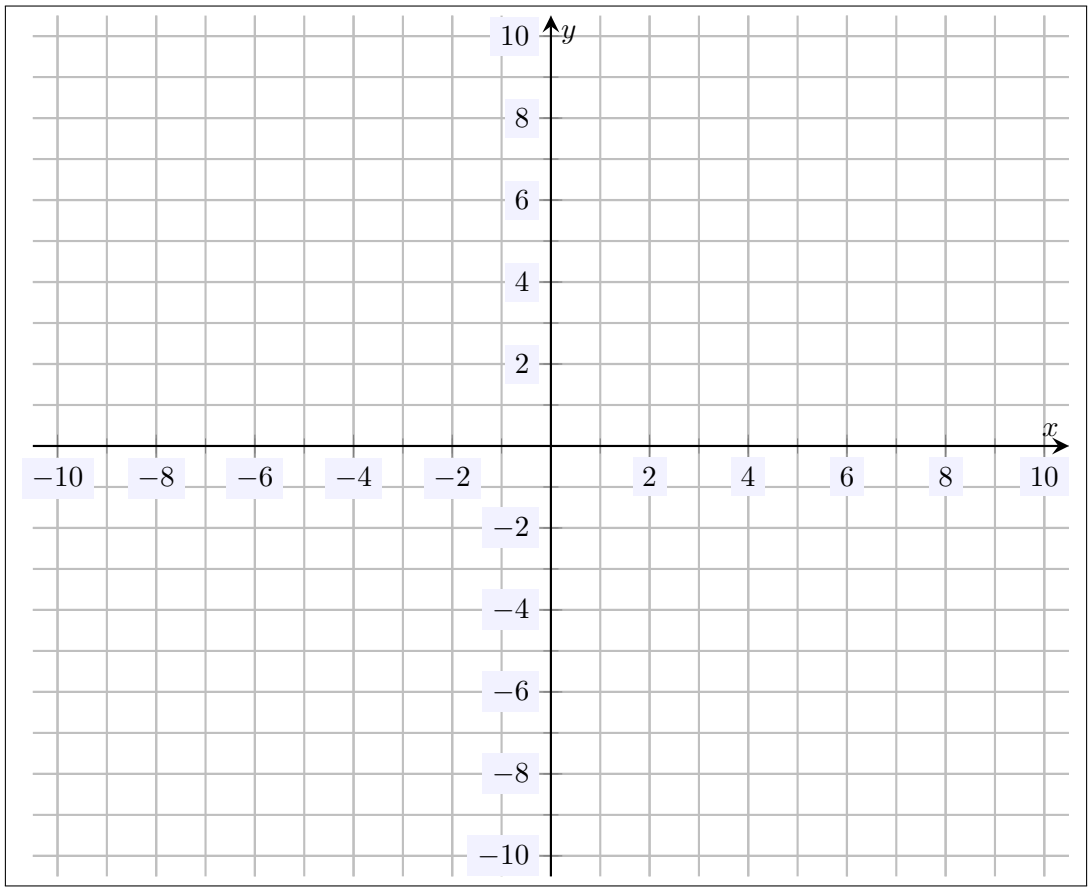
Name: _____

MATH 101
Summer 2022
HW 5: Due 06/01

"Science, my lad, is made up of mistakes, but they are mistakes which it is useful to make, because they lead little by little to the truth."
–Jules Verne

Problem 1. (10pt) Define what makes a function linear. What 'form' does every linear function of one-variable have?

Problem 2. (10pt) Being as accurate as possible, sketch the graph of the line $-3x + 5y = 10$.



Problem 3. (10pt) Determine if the following function is linear. Explain why or why not.

x	$f(x)$
0.5	26.45
1.8	21.64
3.9	13.87
4.2	13.44
5.5	7.95
8.1	-1.67

Problem 4. (10pt) Consider the linear equation $15x + 3y = 39$.

(a) Solve the linear equation for y.

(b) Determine the slope and y-intercept for the corresponding line.

(c) Interpret the slope in at least two different ways.

Problem 5. (10pt) Consider the line given by $y = \frac{11}{4}\,x - 6$.

(a) Put the line in standard form.

(b) Is the point $(-12, -27)$ on the line? Explain.

(c) Is the point $(8, 16)$ on the line? Explain.

Problem 6. (10pt) A linear function has a table whose values are given below. Find the equation of the linear function. Be sure to specify the slope and y-intercept.

x	$f(x)$
3	5.7
4	2.4
7	-7.5
11	-20.7

Problem 7. (10pt) Consider the linear function $f(x) = \dfrac{4-3x}{2}$.

(a) Find the slope of this linear function.

(b) Interpret the slope two different ways.

(c) Is the linear function increasing, decreasing, or constant? Explain.

(d) Determine the y-intercept for $f(x)$.

(e) Determine the x-intercept for $f(x)$.

Problem 8. (10pt) You are driving back to college after summer break. It is 12 pm and you are traveling on the highway at a constant speed of 65 mph. Currently, you are 211 mi from college. Let $D(t)$ denote your distance, in miles, that you are from the college t hours from now.

(a) Explain why $D(t)$ is linear.

(b) Find $D(t)$.

(c) What do the slope and y-intercept of $W(t)$ represent in context?

(d) Determine when you will arrive at the college.

Problem 9. (10pt) Showing all your work, find the equation of the line with slope $-\frac{1}{3}$ that passes through the point $(9, 4)$.

Problem 10. (10pt) Showing all your work, find the equation of the line that has x-intercept $(-2, 0)$ and y-intercept $(0, -5)$.