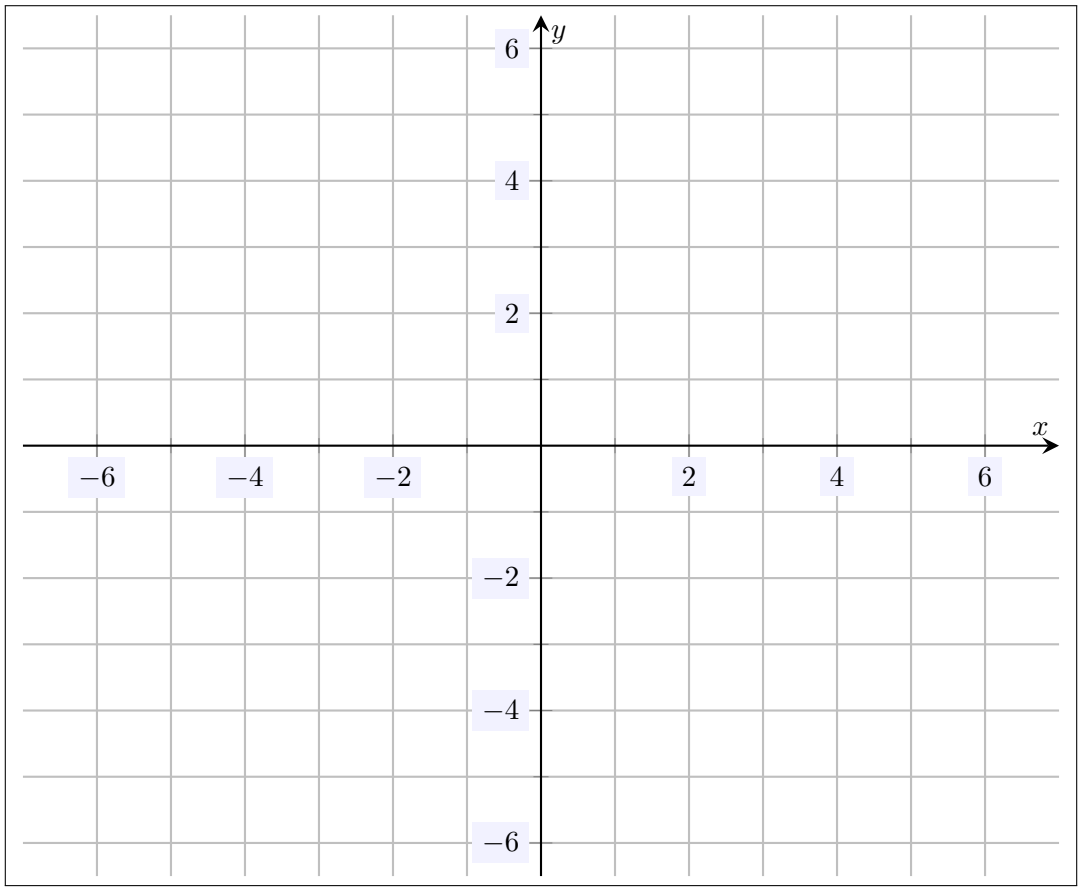
Name: _____

MATH 101
Spring 2022
HW 7: Due 03/03

"Today is a good day to try."
– Quasimodo, The Hunchback of Notre Dame

Problem 1. (10pt) Being as accurate as possible, sketch the graph of the line $2x - 3y = 12$.



Problem 2. (10pt) Consider the linear function $f(x) = 5 - \frac{3}{4}\,x$.

(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 3. (10pt) Showing all your work, find the equation of the line perpendicular to $y = 5 - 3x$ that passes through the point $(1, -4)$.

Problem 4. (10pt) Showing all your work, solve the following linear equation, be sure to verify that your solution satisfies the equation:

$$5x - 6 = 1 - 7x$$

Problem 5. (10pt) Water is flowing into a 'rectangular' box with side lengths 2 ft, 4 ft, and 5 ft at a rate of 3.4 ft^3/min. Currently, the box contains 16 ft^3 of water. Let $W(t)$ denote the amount of water in the box t minutes from now.

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

(b) Find $W(t)$.

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

(d) Determine when the box will begin to overflow.