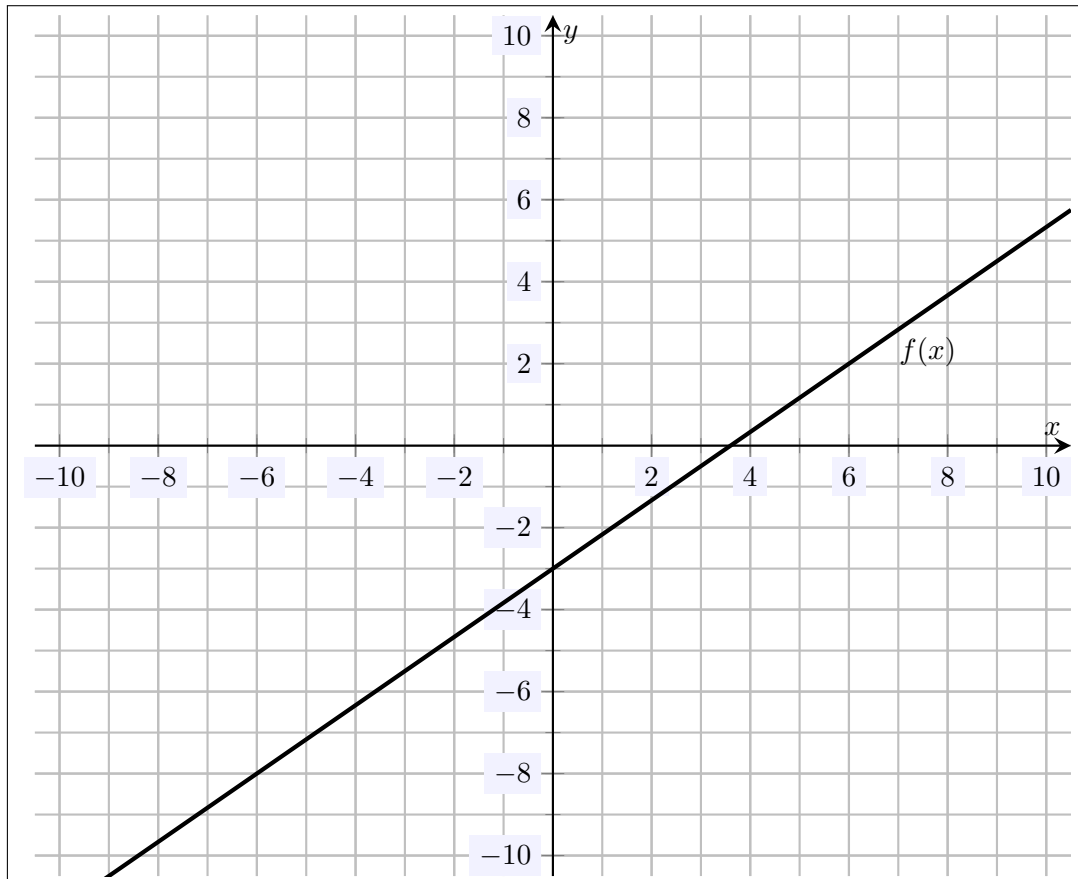


Name: _____
MATH 101
Winter 2021
HW 6: Due 01/12

*"I'm always thinking one step ahead,
like a carpenter that makes stairs."
—Andy Bernard, The Office*

Problem 1. (10pt) A linear function is plotted below. Find the equation of this linear function.



Problem 2. (10pt) Determine if the following pairs of lines are the same, perpendicular, parallel, or none of these.

$$\ell_1 : y = \frac{3}{2}x + 9$$

$$\ell_2 : 9x - 6y = 12$$

Problem 3. (10pt) Determine if the following pairs of lines are the same, perpendicular, parallel, or none of these.

$$\ell_1 : 2x - 3y = 5$$

$$\ell_2 : 6x + 5y = -3$$

Problem 4. (10pt) Determine if the following pairs of lines are the same, perpendicular, parallel, or none of these.

$$\ell_1 : y = -2x + 7$$

$$\ell_2 : -3x + 6y = 15$$

Problem 5. (10pt) Find the equation of the line passing through the points $(6, 21)$ and $(-9, -19)$.

Problem 6. (10pt) Find the equation of the line perpendicular to $y = 4 - 5x$ that passes through the point $(3, -1)$.

Problem 7. (10pt) Find the equation of the line parallel to the line $x = -5$ containing the point $(4, 19)$.

Problem 8. (10pt) Sunita works at an advertising firm. Upon hire, she was paid a \$5,000 signing bonus. The company pays her a yearly salary of \$63,000.

- (a) Write a function which gives the amount of money Sunita has been paid by the company in t years.
- (b) What is the slope and y -intercept for the function in (a)? Interpret both of these in the problem context.
- (c) Find the amount of money Sunita has been paid in 5 years.
- (d) How many years until Sunita has been paid a total of \$200,000.

Problem 9. (10pt) A tour bus company charged a group of 30 people a total of \$180 for a tour. The following week, they charged a group of 50 people \$220.

- (a) Find a linear function, $C(p)$, for the total cost for a tour for a group of size p .
- (b) What is the slope of $C(p)$? Interpret the slope in context.
- (c) What is the y -intercept? Does it have meaning in this context? Explain.
- (d) Estimate much would the company charge for a group of 60 people.
- (e) If you only had \$570, what would you estimate the largest group you could take on the tour?

Problem 10. (10pt) A used car was purchased for \$7,500. Each year, the car loses \$1,200 in value.

- (a) Find a function, $V(t)$, which gives the value, V , for the car after t years.
- (b) What does the slope of $V(t)$ represent?
- (c) What does the y -intercept of $V(t)$ represent?
- (d) What is the car worth in 3 years?
- (e) How long until the car is essentially worthless?