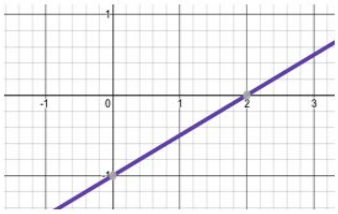
MATH 120: Test 1 Review

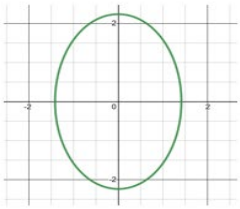
I. Determine if the Relation is a Function

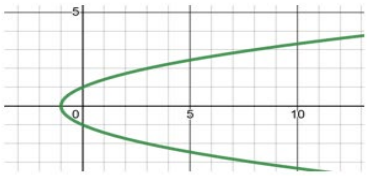
a) $x^2 + y^2 = 36$

b) $\{(6,1), (6,2), (8,3), (9,4)\}$

c)







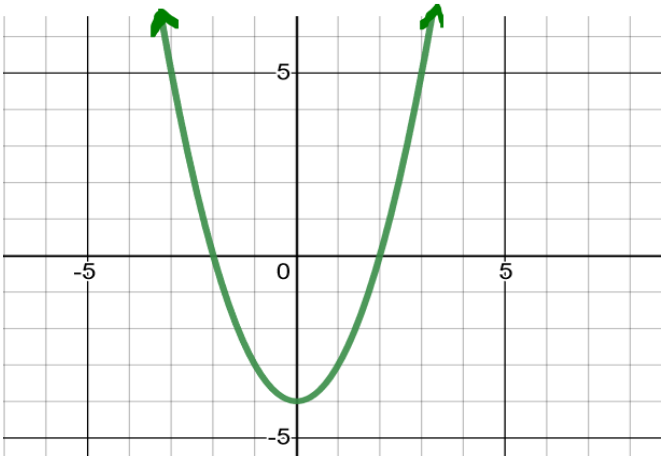
II. Interpret a Function in Context

The table shows the chances (as a percent) of an adult surviving to various ages after reaching 60 years old in a particular country. One model that fits the data is the function $g(x) = -2.9x + 287$

Age	70	80	90	100
Chance of Survival	85	58	24	2.7

What do the variables x and $g(x)$ represent? Use the model to evaluate $g(80)$ and interpret its meaning in a sentence. How does it compare to the actual value from the data set?

III. Find the Domain/Range, Intercepts, and Interval(s) Where the Function Increases/Decreases, and Extrema.



Is the graph symmetrical across the x-axis, y-axis, or origin?

Is the function even, odd, or neither?

IV. Write a linear equation

a) A company that manufactures bicycles has a fixed cost of $100,000. It costs $100 to produce each bicycle. The total cost for the company is the sum of its fixed cost and variable costs. Write the total cost, *C,* as a function of the number of bicycles produce, *x*. Then find and interpret *C(90).*

V. Evaluate the Piecewise Function

$$f(x)=\begin{cases}6x-1 & \text{if } x<0\\ 7x+3 & \text{if } x\geq 0\end{cases}$$

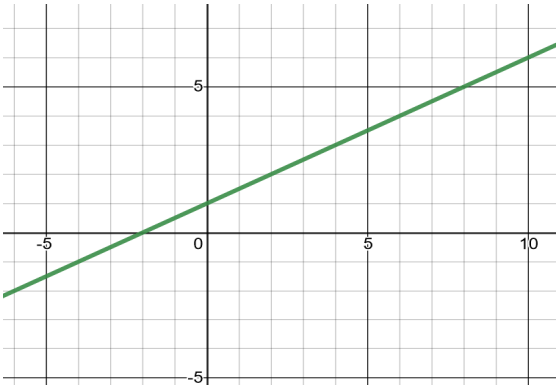
a) *f(-3)* b) *f(0)* c) *f(4)*

VI. Find the Equation of the Line

a) Parallel to the line $y = 2x$ that passes through the point $(1, -3)$

b) Perpendicular to the line $y = 2x$ that passes through the point $(2, -1)$

c) Whose graph follows:



d. Parallel to the line with a slope of 0 going through the point (4, -7).

VII. Find the Average Rate of Change

The age (in years) and expected length (in inches) of certain species of fish is modeled by the function: $f(x) = 0.016x^3 - 0.372x^2 + 3.95x + 1.21$; find the average rate of change in expected length between a fish at 10 and 15 years. Include units. Interpret your answer in a sentence.

VIII. Construct and Simplify the Difference Quotient

a) $f(x) = 3x + 7$ b) $g(x) = 7x^2 - 2$

IX. Find the Domain of the Function

a) $h(x) = \sqrt{3x - 2}$ b) $g(x) = \frac{1}{x-3} + \frac{1}{x}$ c. $f(x) = 8x - 1$

X. Compose the Functions

Let $f(x) = 3x - 4$ and $g(x) = x^2 + 6$

a) Find $(f \circ g)(x)$ b) Find $(g \circ f)(x)$ c) Find $(g \circ f)(3)$

XI. Decompose the Function so $h(x) = (f \circ g)(x)$. Report f(x) and g(x).

a) $h(x) = \sqrt[3]{5 - x^8}$ b) $h(x) = \frac{1}{5x+6}$

XII. Find the Inverse for the 1:1 Function and its domain

a) $f(x) = 2x - 1$ b) $f(x) = \sqrt{x-9}$