

Mth 111 Lab #2 Franz Helfenstein NAME

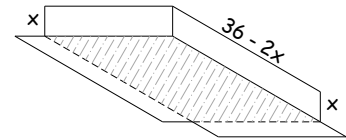
This lab is intended to review some of the things we have done so far. You are encouraged to work together. As necessary, attach additional paper but put your final answer on this paper. Your work will be graded on completeness, neatness, accuracy and punctuality. You must show your work! (10 pts)

- 1) In Unit A, 244 adult deer and 47 fawns at midsummer. In unit B, 386 adult deer and 84 fawns.
- (a) Let x = deer. Let y = fawns. Write the two data points as ordered pairs.
- (b) Find an equation (S-I form) for the fawns as a function of deer. $F = f(x)$.
- (c) What does the x -intercept (root) represent?
- (d) What does this model say about the viability of a Unit with less than 50 deer?

2a) Use algebra to solve for x
 $(2x - 3)(3x + 5) = 77$

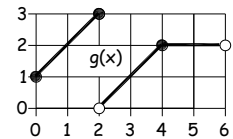
2b) Use algebra to solve for x
 $2 - 3 \cdot \frac{7 - 3x}{2} = 10 - \frac{2x}{3}$

- 3) A 2' x 3' cardboard rectangle is made into a box by snipping squares from the corners and folding.



- (a) Let x = inches cut out of each corner. Write an equation for the volume of the box as a function of x . $V = f(x)$.
- (b) Graph $f(x)$ in the window $[0, 12] \times [0, 2000]$
- (c) What dimensions will yield the largest volume?
- (d) Why are we only considering $0 < x < 12$?

- 4) (a) Is $g(x)$ a function? (circle) YES NO
- (b) What is the domain of $g(x)$?
- (c) What is the range of $g(x)$?



- (d) Write $g(x)$ as a piecewise function in algebraic form. Be sure to include the domain restrictions.

$$g(x) = \left\{ \begin{array}{l} \\ \\ \\ \end{array} \right.$$

5) Give the Domain for (a) $y = \frac{2 + 3x}{2x - 4} + 1$ (b) $y = \sqrt{x^2 + 1} - 1$ (c) $y = \frac{1 + x}{1 - x^2}$

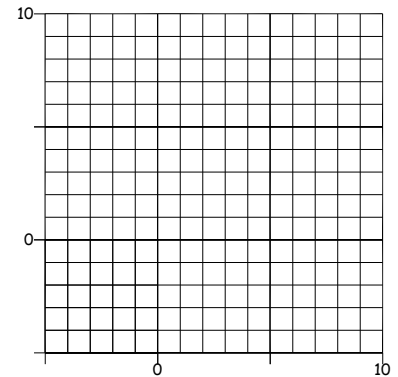
- 6) Sam keeps track of the number of miles driven (x) and the gallons used (G). Is G a function of x ? Why/why not?

- 7) Graph this quadratic and adjust the viewing window to show all four critical points. Then draw a sketch of your graph. Include your CP's coordinates on your graph.

$$y = -0.1x^2 - 0.5x + 15$$

- 8) Graph $f(x)$

$$f(x) = \begin{cases} 0.5x^2, & -4 < x \leq 0 \\ x + 1, & 0 < x < 3 \\ 5, & 3 \leq x \leq 8 \end{cases}$$



- 9) Here is a graph of the piecewise function $y = f(x)$.

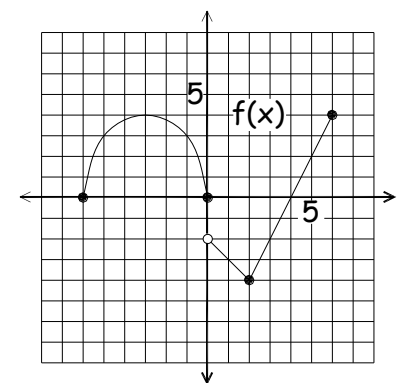
- (a) What is the domain of this function?

- (b) What is the range of this function?

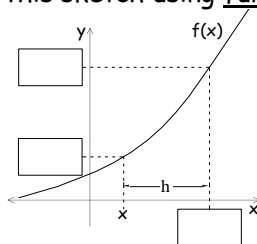
- (c) $f(0) =$ (d) $f(-5) =$ (e) $f(8) =$

- (f) Where (for what x-value) is $f(x) = -2$?

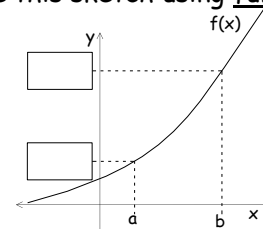
- (g) Where (for what x-value) is $f(x) = 4$?



- 10a) Complete this sketch using function notation.



- 10b) Complete this sketch using function notation.



- 10c) What does $\frac{f(x+h) - f(x)}{h}$ represent graphically?

BONUS

Use $f(x) = x^2 - 3x + 5$

- (a) Find $f(x + 1)$ and rewrite in standard form

- (b) Evaluate and simplify the difference quotient i.e. $\frac{f(x+h) - f(x)}{h}$