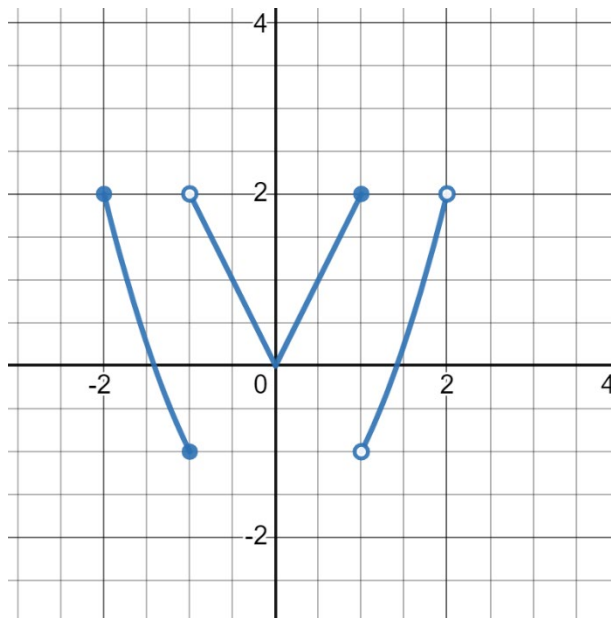# Math 1151 Workshop 0: Refresh and Tips

Mathematics and Statistics Learning Center (mslc.osu.edu/tutoring)

Problem 1: Try on your own, write down any questions, then look for answers

Consider the following graph of a function f:

a) What is the domain of the function f?

b) What is the range of the function f?

c) What is the y-intercept of the graph?

d) What is $f(-1)$?

e) Solve the equation $f(x) = 2$.

f) Is the function f odd, even, or neither?

g) List the intervals where f is increasing.

h) List the intervals where f is decreasing.

i) Is the function f invertible?

j) Give an interval where f is one-to-one.

Problem 2: Reflect on the problem after finishing: why did I ask it?

Draw a graph below of a function f with the following properties.

a) The domain of f is $[-4,3)$.

b) The range of f is $[-3,3)$.

c) The y-intercept of the graph of f is $(0,0)$.

d) $f(-1) = 2$

e) f is increasing on the interval $(-3, -2)$.

f) f is decreasing on the interval $(0,1)$.

g) f is one-to-one on the interval $(2,3)$.
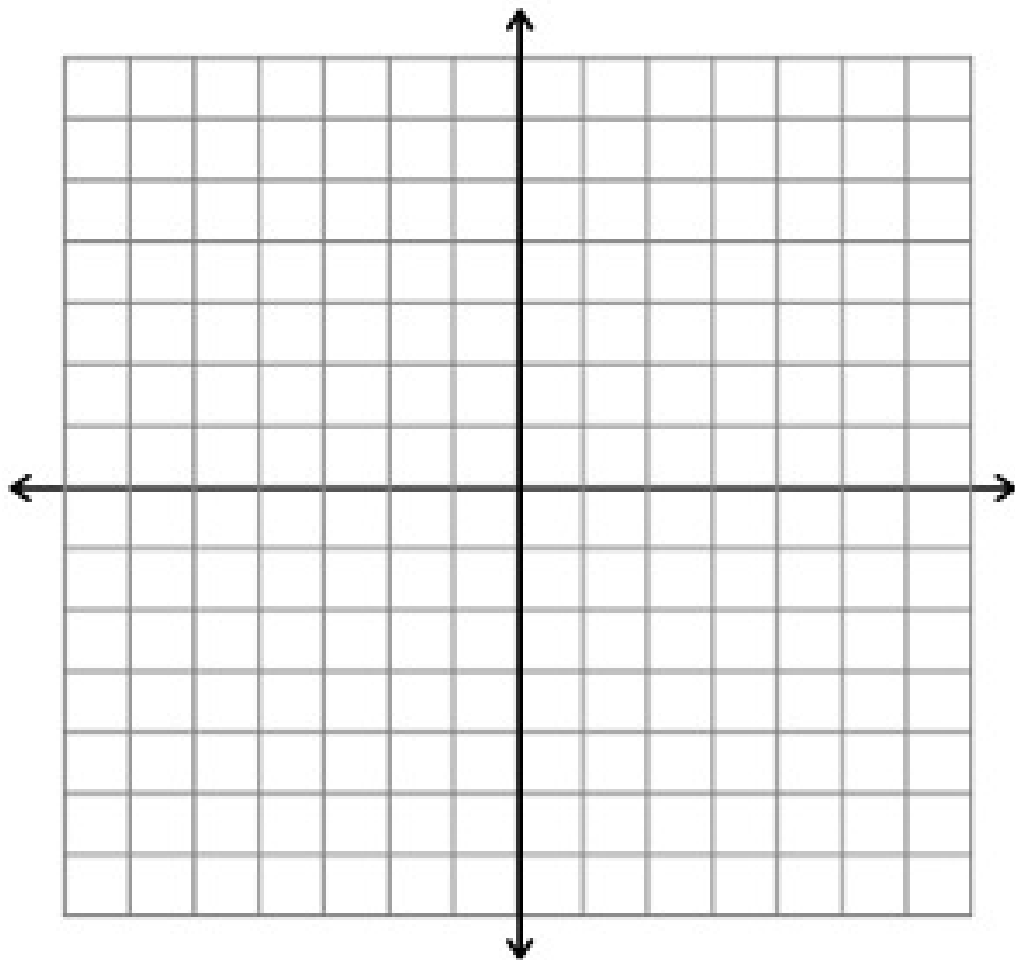
Determine the domain of the function f. Recall that an expression is undefined if its denominator is 0, it has a negative underneath an even root, or the argument of a logarithm is non-positive.

a) $f(x) = \frac{x}{x+2}$

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

c) $f(x) = \log(7x)$

d) $f(x) = \frac{2}{x^2-4}$

e) $f(x) = \frac{\sqrt{1-x}}{x+2}$

f) $f(x) = \frac{x}{\sqrt{1-x}}$

g) $f(x) = \frac{1}{\log(7x)}$

Evaluate the following:

a) $\ln(e^{-5})$

b) $e^{\ln(-5)}$

c) $\sqrt{4^2}$

d) $\sqrt{(-4)^2}$

Are any of the results surprising? Can you explain them? Explanation is a key skill we want you to learn in Calc 1.

Recall the following logarithm rules:

1. $\log_b(xy) = \log_b(x) + \log_b(y)$
2. $\log_b(x/y) = \log_b(x) - \log_b(y)$
3. $\log_b(x^p) = p \log_b(x)$

Combine the following logarithms into one logarithm with coefficient 1.

$$\log(x) - \frac{1}{2}\log(y) + 3\log(z)$$

Expand the following logarithm as much as possible. Try to have the inputs to the logarithms be as simple as possible.

$$\log\left(\frac{x^2\sqrt{y}}{z^3}\right)$$