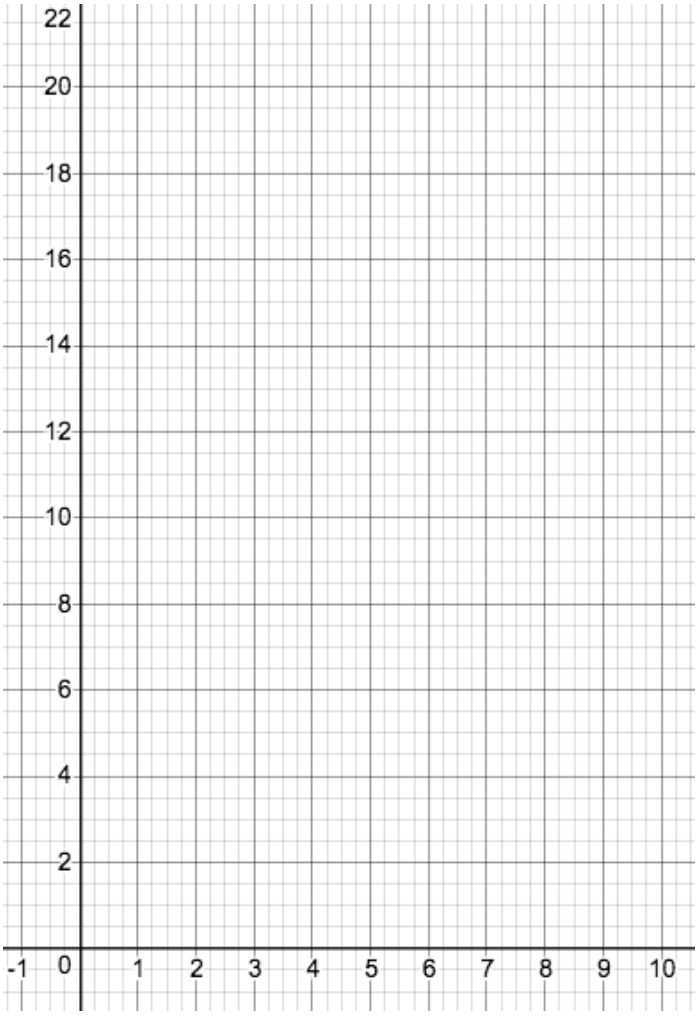
Functions Day 2: In Class

Piecewise Functions

The Beginning of the Infection

Johnny is out on his vacation to Florida when he is bitten by a mosquito carrying a virus that is unknown to man. A zombie apocalypse is in the works. Below is a timeline of what happens to Johnny…

- When Johnny is bitten, the mosquito passes on 1 milliliter of virus contaminated blood.
- Once inside the body, the volume of contaminated blood in the body grows (as the virus spreads) at a constant rate of 2 milliliters per hour.
- At 4 hours, Johnny is bitten by another mosquito which gives him 1 more milliliter of contaminated blood.
- After the second bite the virus grows at a constant rate of 5 milliliters per hour.



Using the description above, draw a graph of the volume of contaminated blood in Johnny's body as a function of time (in hours).

1) Is there way you can represent this function with one equation? Why or Why not?

2) What functions do you see in this graph? Give equations and what time values apply to each function.

3) Assuming this function continues, what is its domain and range?

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Piecewise Functions

A ***piecewise function*** is a function that has different _____ for different _____ of the _____.

We represent piecewise functions symbolically using a bracket as follows:

$f(x) =$ $\begin{cases} \\ \\ \end{cases}$

Examples of ***holes***

Examples of ***jumps***

Continuity

A function is ***continuous*** if there are no _____ or _____.

The "rule" or equation if linear is easiest written in point-slope form:

$$y = m(x - x_1) + y_1$$

where x_1 is _____

and y_1 is _____

and m is _____

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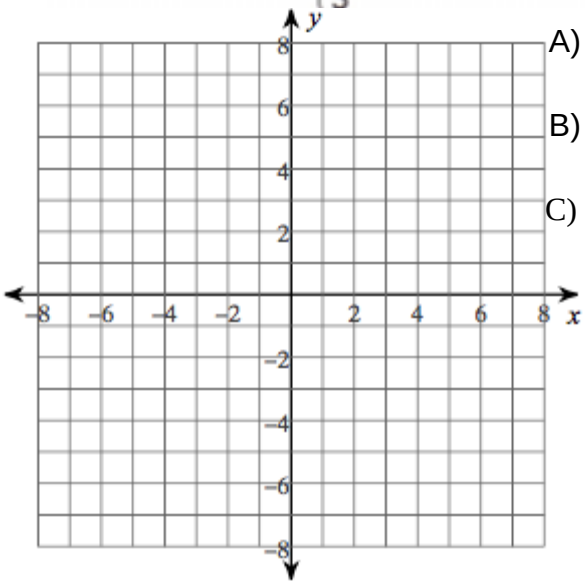
Piecewise Functions

Graph the following functions and A) give their domain and range and B)indicate whether they are continuous or not and C) give f(0) and f(3).

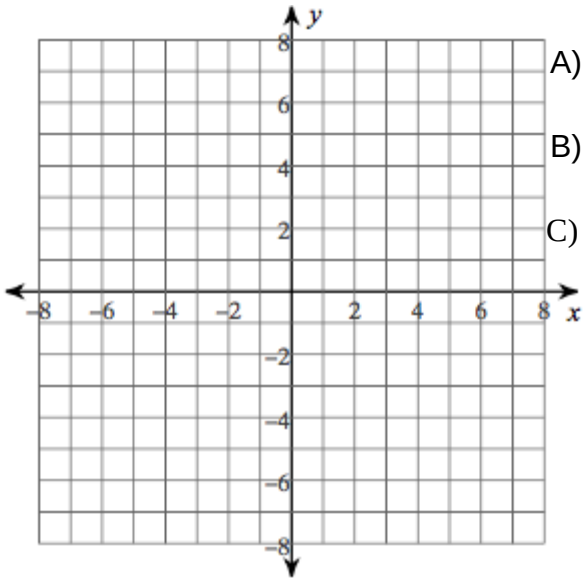
4)

$$h(x)=\begin{cases} x^2-4, & x<3 \\ \frac{2}{3}x-5, & x\geq 3 \end{cases}$$



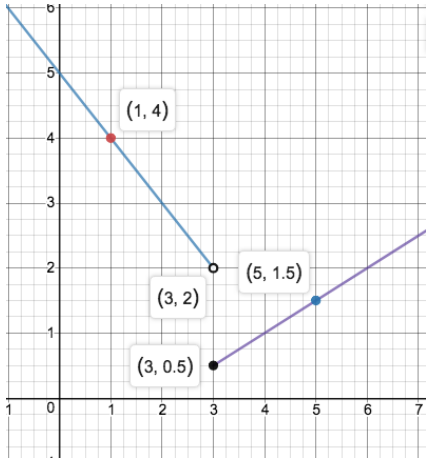
5)

$$g(x)=\begin{cases} -x+2, & x<2 \\ x-2, & x\geq 2 \end{cases}$$



Write a piecewise equation for each of the following graphs and give their domain and range and indicate whether they are continuous or not.

6)



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