WS #4

Precalculus – Piecewise Functions – sections 1.3

Name_____ Date_____ Per_____

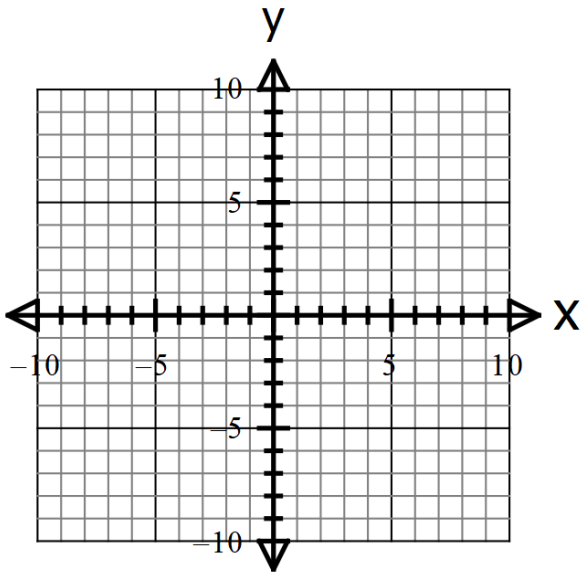
Do this homework on this paper!

For the following functions:

a) Graph the function and label at least three points on the graph.
b) Find the domain of the function.
c) Find the range of the function.
d) List the intercepts of the function, if there are any.
e) Find the requested function values.

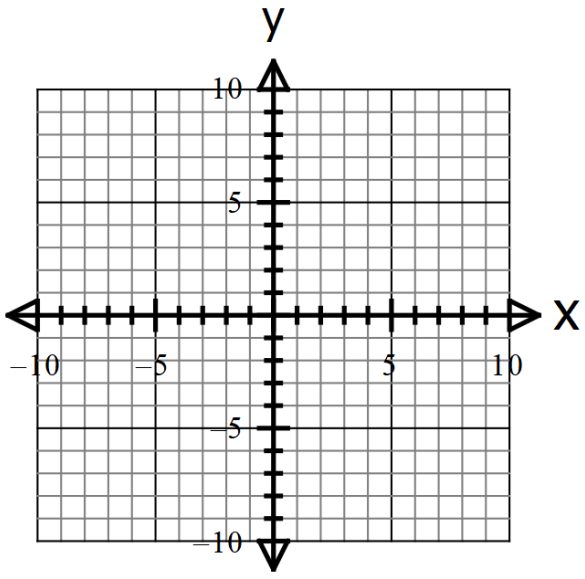
1. $f(x)=\begin{cases}2x-4 & \text{if } -1\le x\le 2\\ -\frac{1}{2}x+5 & \text{if } 2<x\le 4\end{cases}$

Find $f(0)$, $f(2)$, and $f(4)$.



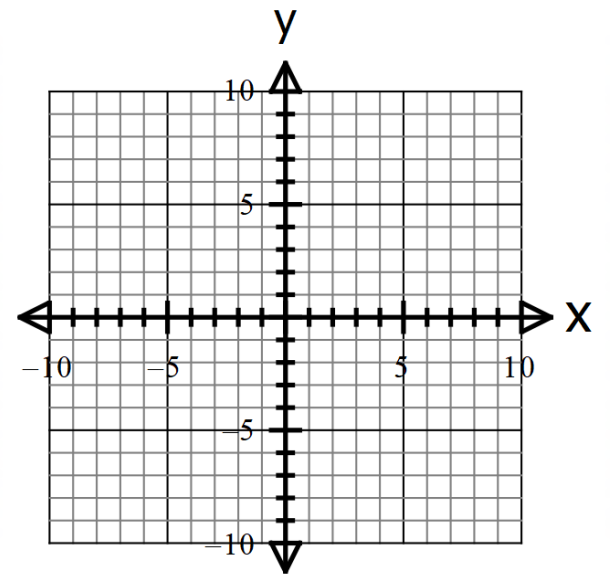
2. $f(x)=\begin{cases}x^2 & \text{if } x<0\\ 2 & \text{if } x=0\\ 2x+1 & \text{if } x>0\end{cases}$

Find $f(-2)$, $f(0)$, and $f(2)$.



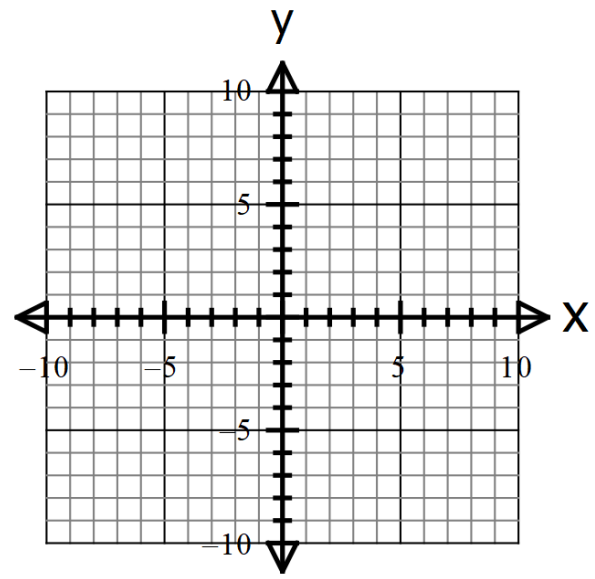
4. $f(x)=\begin{cases}|x|+2 & \text{if } -2\le x<1\\ 5 & \text{if } x=1\\ -x+2 & \text{if } x>1\end{cases}$

Find $f(-2)$, $f(1)$, and $f(3)$.



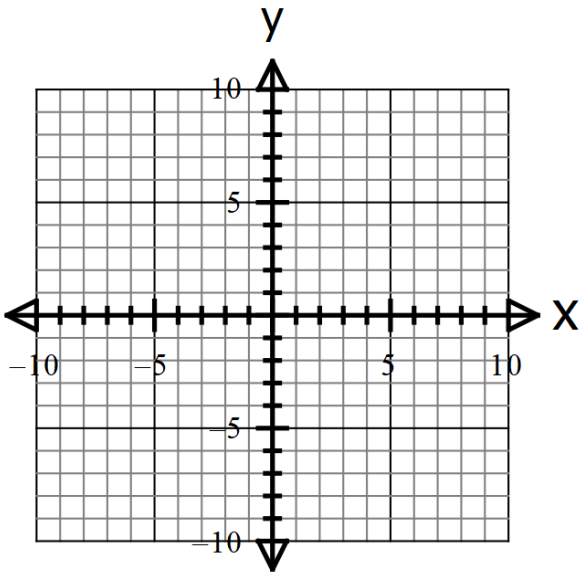
5. $f(x)=\begin{cases}1+x & \text{if } x<0\\ x^2 & \text{if } x\ge 0\end{cases}$

Find $f(-5)$, $f(0)$, and $f(7)$.



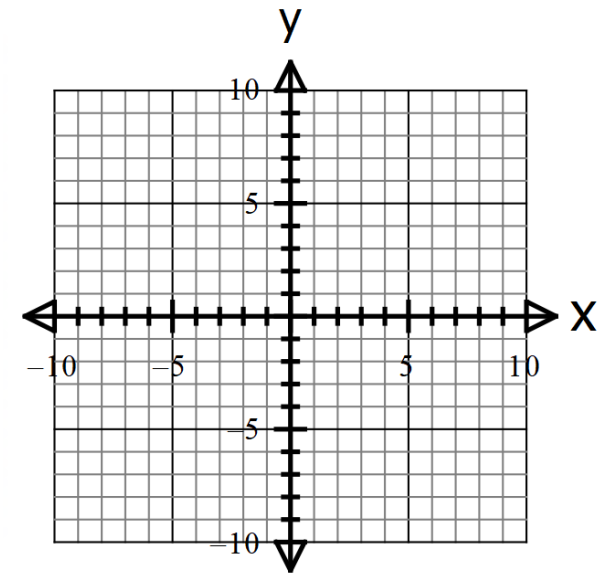
6. $f(x)=\begin{cases} x & \text{if } -3 \le x < 0 \\ \sqrt{x} & \text{if } x > 0 \end{cases}$

Find $f(-2)$ and $f(4)$.

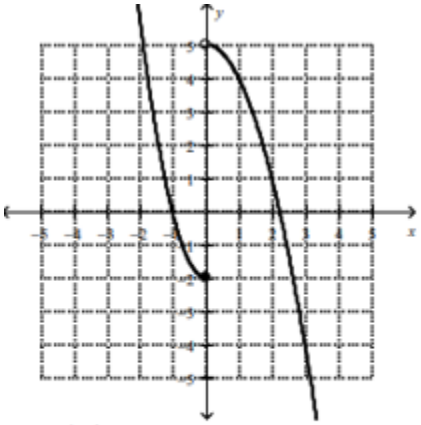


7. $f(x)=\begin{cases} 2-x & \text{if } -4 \le x < 1 \\ 2x-1 & \text{if } 1 \le x < 3 \\ -3 & \text{if } x \ge 3 \end{cases}$

Find $f(0)$, $f(1)$, and $f(3)$.



Choose the proper equation for the piecewise function graphed below.



Choices:

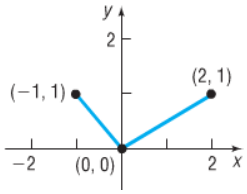
$f(x) = \begin{cases} 2x^2 + 5, & x \le 0 \\ -x^2 - 2, & x > 0 \end{cases}$

$f(x) = \begin{cases} 2x^2 + 2, & x < 0 \\ -x^2 - 5, & x \ge 0 \end{cases}$

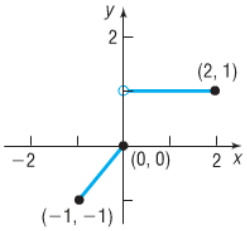
$f(x) = \begin{cases} 2x^2 - 2, & x \le 0 \\ -x^2 + 5, & x > 0 \end{cases}$

In problems 9 - 12, the graph of a piecewise function is given. Write a definition for each function.

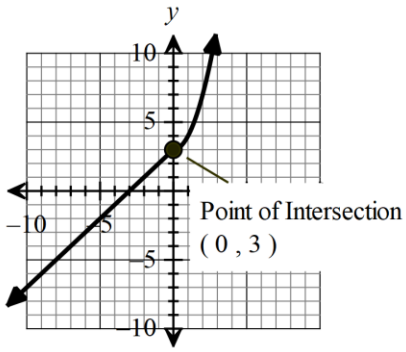
9.



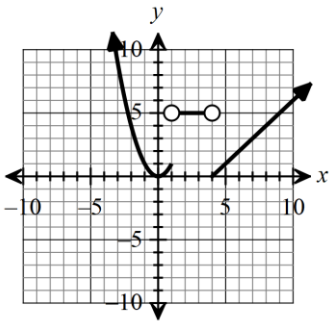
10.



11.



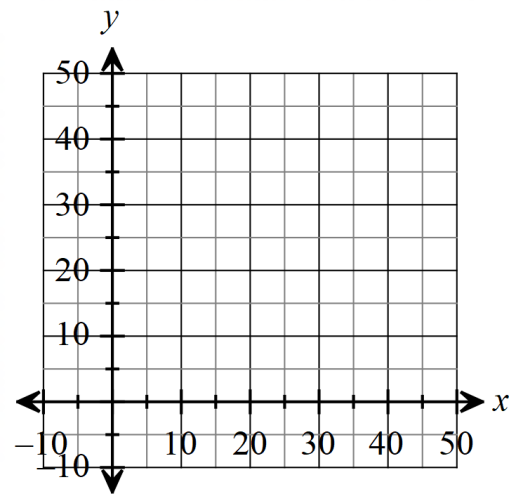
12.



13. Your favorite dog groomer charges according to your dog's weight. If your dog is **15** pounds and under, the groomer charges **$35**. If your dog is between **15** and **40** pounds, she charges **$40**. If your dog is over **40** pounds, she charges **$40**, plus an additional **$2** for each pound.

(a) Write a piecewise function that describes what your dog groomer charges.

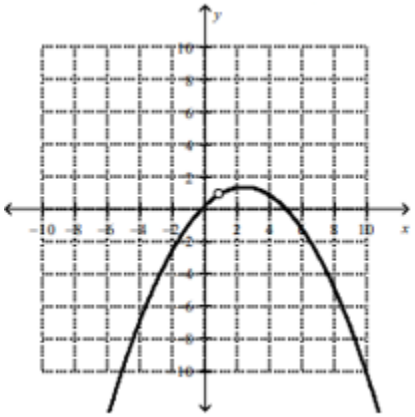
(b) Graph the function.



(c) What would the groomer charge if your cute dog weighs **60** pounds?

14. You plan to sell **She Love Math** t-shirts as a fundraiser. The wholesale t-shirt company charges you **$10** a shirt for the first **75** shirts. After the first **75** shirts you purchase up to **150** shirts, the company will lower its price to **$7.50** per shirt. After you purchase **150** shirts, the price will decrease to **$5** per shirt. Write a function that models this situation.

15. Find $f(1)$ for the function given below.



16. Is this function continuous?

$$f(x)=\begin{cases}-17x^2+4, & \text{if } x<0\\ 10 & \text{if } x\geq 0\end{cases}$$

17. What value of a would make this piecewise function **continuous**?

$$f(x)=\begin{cases}3x^2+4, & \text{if } x<-25\\ x+a, & \text{if } x\geq -2\end{cases}$$