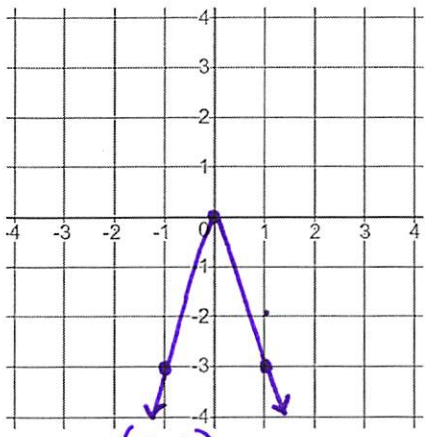
Topic 5 Test Review Name Key

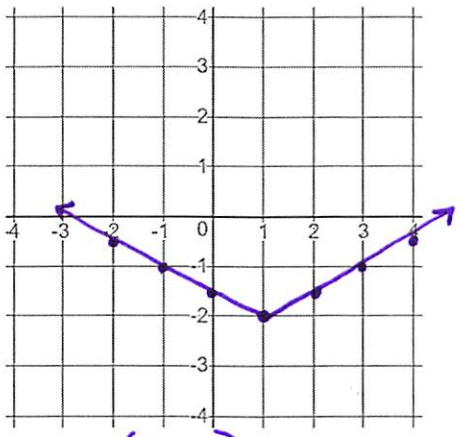
Graph each function then state the vertex, axis of symmetry, domain, and range

1. $f(x) = -3|x|$



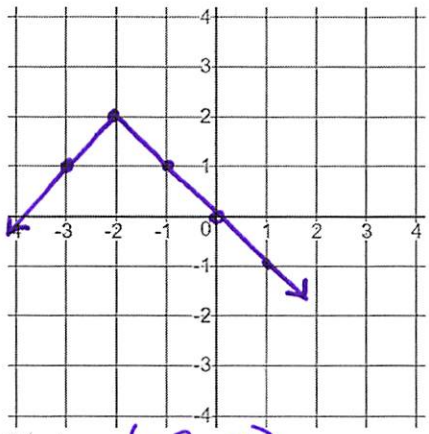
Vertex: (0,0)
Axis of Symmetry: $x = 0$
Domain: $x \in (-\infty, \infty)$
Range: $y \in (-\infty, 0]$

2. $f(x) = \frac{1}{2}|x-1|-2$



Vertex: (1, -2)
Axis of Symmetry: $x = 1$
Domain: $x \in (-\infty, \infty)$
Range: $y \in [-2, \infty)$

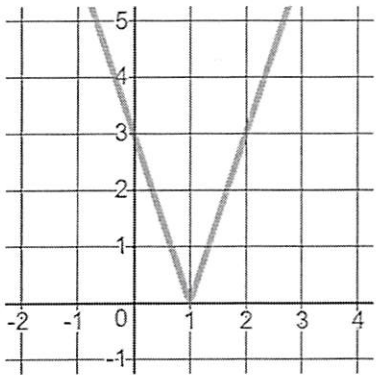
3. $f(x) = -|x+2|+2$



Vertex: (-2, 2)
Axis of Symmetry: $x = -2$
Domain: $x \in (-\infty, \infty)$
Range $y \in (-\infty, 2]$

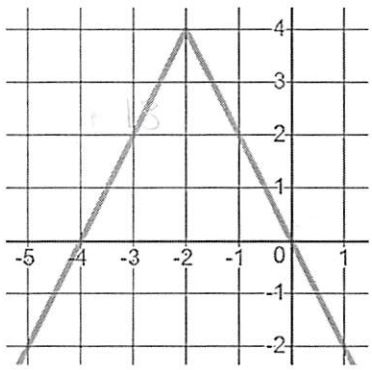
For each graph, write the equation, find the average rate of change, and where the function is increasing

4.



Equation: $y = 3|x-1|$
Average ROC over the interval $x \in [1,2]$: $\frac{3}{1} = 3$
State the interval where $f(x)$ is increasing: $x \in (1, \infty)$

5.



Equation: $y = -2|x+2|+4$
Average ROC over the interval $x \in [-1,2]$: $\frac{-4}{2} = -2$
State the interval where $f(x)$ is increasing: $x \in (-\infty, -2)$

Solve each equation for *x*.

6. $2-|2x-3|=1$

$-|2x-3| = -1$
$|2x-3| = 1$
$2x-3=1$ $\quad$ $2x-3=-1$
$2x=4$ $\quad$ $2x=2$
$x=2$ $\quad$ $x=1$

7. $4|2+4x|=8$

$|2+4x| = 2$
$2+4x=2$ $\quad$ $2+4x=-2$
$4x=0$ $\quad$ $4x=-4$
$x=0$ $\quad$ $x=-1$

8. $|4+2x|-3=9$

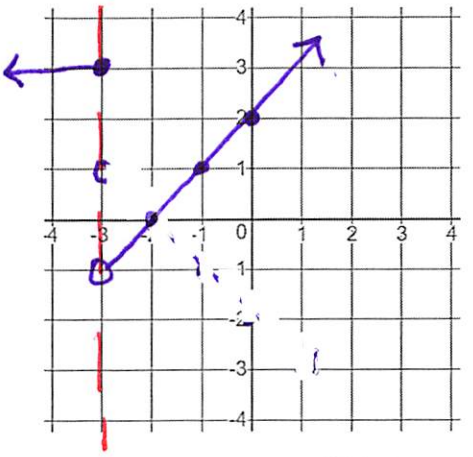
$|4+2x| = 12$
$4+2x=12$ $\quad$ $4+2x=-12$
$2x=8$ $\quad$ $2x=-16$
$x=4$ $\quad$ $x=-8$

7. Lisa's school is selling wrapping paper as a fundraiser. For up to 30 wrapping paper rolls, it cost \$5 per roll and \$3 for shipping. 31 to 60 rolls cost \$4 each with \$3 for shipping. More than 60 rolls cost \$3 per roll with no shipping fee. Write a piecewise defined function for the cost of wrapping paper.

$$f(x)=\begin{cases}5x+3, & x\le 30\\ 4x+3, & 31<x\le 60\\ 3x, & x>60\end{cases}$$

Graph each piecewise defined function and then state the domain and range

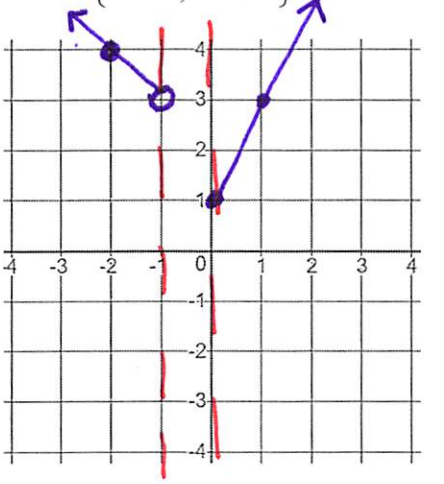
8. $f(x)=\begin{cases}3, x\le -3\\ x+2, x>-3\end{cases}$



Over what intervals is $f(x)$ increasing:

$x\in(-3,\infty)$

9. $f(x)=\begin{cases}-x+2, x<-1\\ 2x+1, x\ge 0\end{cases}$

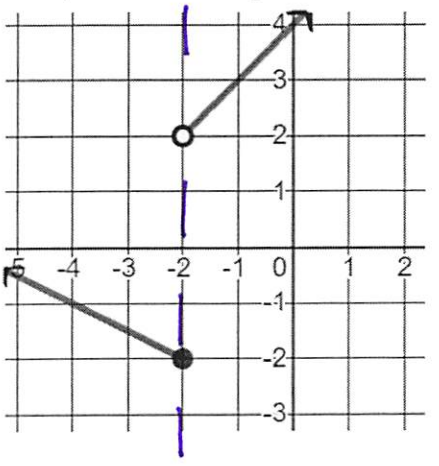


What is the average ROC over the interval $x\in[0,1]$

$\frac{2}{1}=2$

Write the equation for the piecewise function below

10.



$$y=\begin{cases}-\frac{1}{2}x-3, & x\le -2\\ x+4, & x>-2\end{cases}$$