Honors Math 3 Unit 1 Study Guide 2020 Name: Key

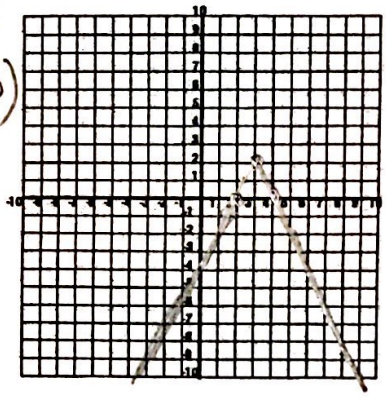
Graph each function

1. $y = -2|x-3|+2$

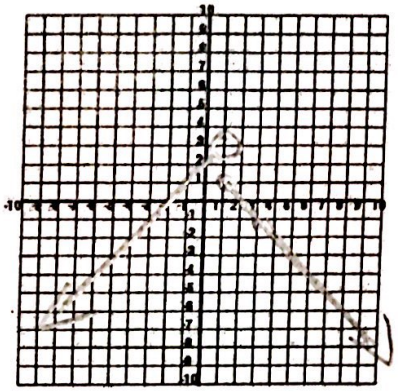
Vertex: (3, 2)

Domain: $(-\infty, \infty)$

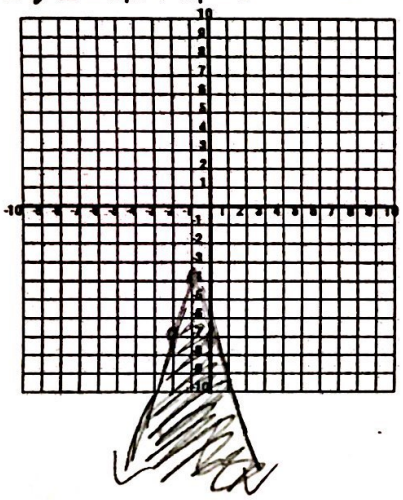
Range: $(-\infty, 2]$



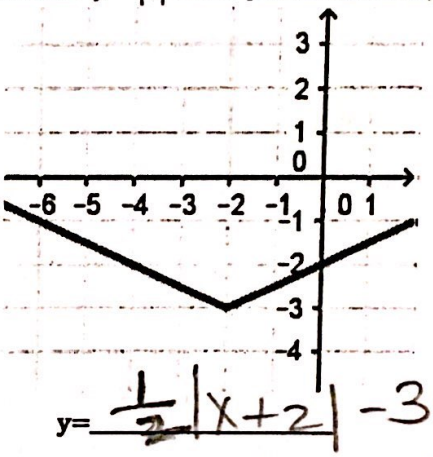
2. $f(x) = \begin{cases} x+2, \text{if } x > 1 \\ -x+2, \text{if } x \le 1 \end{cases}$



3. $y \le -3|x+1|-4$ V: $(-1, -4)$



4. **Given the graph, write the equation:**
(Assume $y = |x|$ is the parent function.)



y= $\frac{1}{2}|x+2|-3$

Evaluate the following piecewise functions for the given domain.

5. $f(x) = \begin{cases} x^2-1, \text{if } x \le 0 \\ 2x-1, \text{if } 0 < x \le 5 \\ 3, \text{if } x > 5 \end{cases}$

a) $f(-2) = 3$ b) $f(0) = -1$ c) $f(5) = 9$

d) $2f(3) - f(6) = 7$

$2(5)-3$

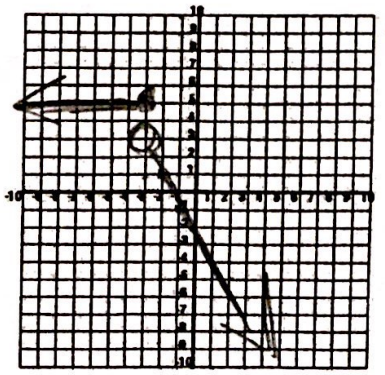
6. $f(x) = \begin{cases} 5, \text{if } x \le -3 \\ -2x-3, \text{if } x > -3 \end{cases}$

a) $f(-4) = 5$ b) $f(0) = -3$ c) $f(3) = -9$

d) $f(x) = -11$

$x = 4$

Sketch 6 there →

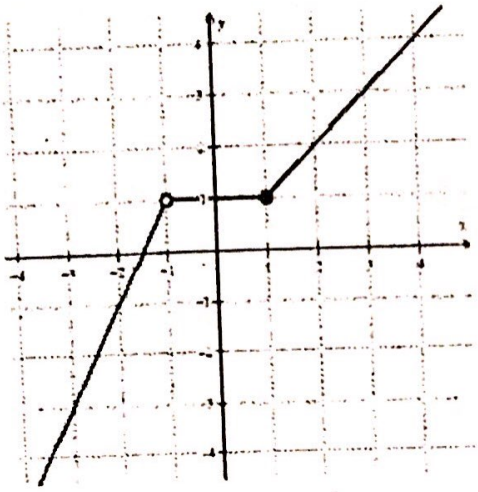


$-2x-3 = -11$

$-2x = -8$

$x = 4$

7. Evaluate the function using the given graph:



a. $f(-3) =$ -3

b. $f(4) =$ 4

c. $f(1) =$ 1

d. $f(-1) =$ DNE

e. $f(0) =$ 1

f. $f(x) = -1$; $x =$ -2

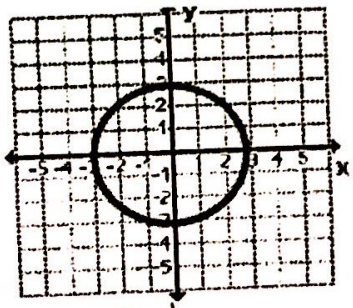
8. For the given functions, find each value.

$f(x) = -5$, $g(x) = x^2 + 2x - 1$, $h(x) = 3x - 4$

a. $f(3) =$ -5 b. $4g(-4) =$ 28 c. $2f(0) + g(-1) - 3h(8) =$ -72

Tell whether each graph below is a **function** or not by writing "yes" or "no". Then determine the **domain** and **range** of each graph.

9)

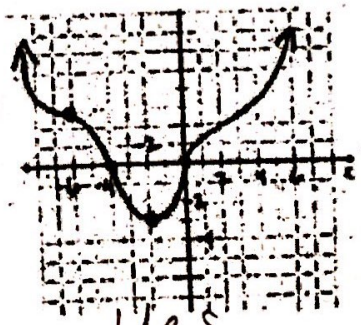


Function? No

Domain: $[-3, 3]$

Range: $[-3, 3]$

10



Function? Yes

Domain: $(-\infty, \infty)$

Range: $[-3, \infty)$

Increasing: $(-2, \infty)$

Decreasing: $(-\infty, -2)$

Positive: $(-\infty, -4) \cup (0, \infty)$

Neg. $(-4, 0)$

Solve each problem. **SHOW** your work and box in the final answer. Write the inequalities in interval notation and show the solution on a number line.

11. $|2x-1|=5$

$2x-1=5 \quad 2x-1=-5$

$2x=6 \quad 2x=-4$

$x=3 \quad x=-2$

$\{-2,3\}$

12. $2|x+4|-6=10$

$|x+4|=8$

$x+4=8 \quad x+4=-8$

$x=4 \quad x=-12$

$\{-12,4\}$

13. $|3x+1|+10=4$

$|3x+1|=-6$

No solution

14. $|3x-7|=5x-4$

$3x-7=5x-4 \quad 3x-7=-5x+4$

$-3=2x \quad 8x=11$

~~$x=-3/2$~~ $x=\frac{11}{8}$

Check! Doesn't work

Check - works

15. $2+|x+5|>8$

$|x+5|>6$

$x+5>6 \quad x+5<-6$

$x>1 \quad x<-11$

$(-\infty,-11)\cup(1,\infty)$

16. $-4|3x+2|\geq -16$

$|3x+2|\leq 4$

$3x+2\leq 4 \quad 3x+2\geq -4$

$3x\leq 2 \quad 3x\geq -6$

$x\leq 2/3 \quad x\geq -2$

$[-2, 2/3]$

17. $\frac{|2x+1|}{2}-3<6$

$\frac{|2x+1|}{2}<9$

$|2x+1|<18$

$2x+1<18 \quad 2x+1>-18$

$2x<17 \quad x<17/2 \quad 2x>-19 \quad x>-\frac{19}{2}$

$(-19/2, 17/2)$

18. $|x+8|<-6$

No solution

19. A packaging company has a tolerance of 0.3 oz for a bag of chips that is supposed to weigh 12 oz. Write and solve an absolute value inequality for the acceptable weights.

$|x-12|\leq 0.3$

$[11.7, 12.3]$ oz