

Algebra 2 Unit 2 – Functions

Name: Mrs. MacDonald

Review Must show ALL work to receive full credit

Determine if each is a function and state the domain and range.

1) $(3, 6), (3, 7), (-5, 4), (1, -5), (5, 3)$

Is this relation a function? Yes ☒ or No ☐

Domain: $\{-5, 1, 3, 5\}$

Range: $\{-5, 3, 4, 6, 7\}$

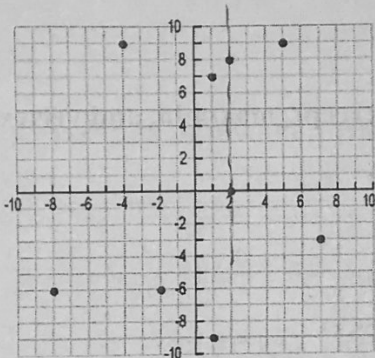
2) $(1, 4), (3, 8), (-2, 5), (2, 8), (-3, 5)$

Is this relation a function? Yes ☒ or No ☐

Domain: $\{-3, -2, 1, 2, 3\}$

Range: $\{4, 5, 8\}$

3)

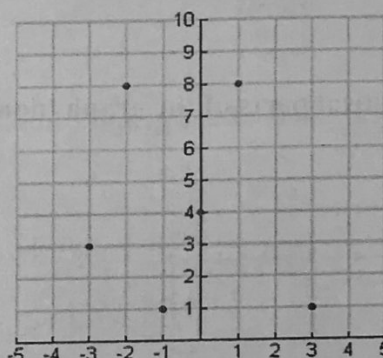


Is this relation a function? Yes ☒ or No ☐

Domain: $\{-8, -4, -2, 1, 2, 5, 7\}$

Range: $\{-9, -6, -3, 0, 7, 8, 9\}$

4)

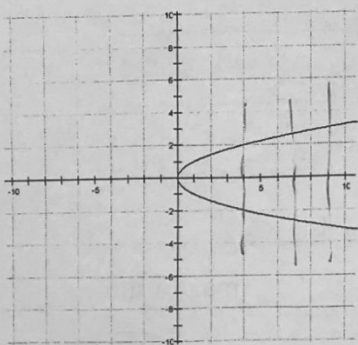


Is this relation a function? Yes ☒ or No ☐

Domain: $\{-3, -2, -1, 0, 1, 3\}$

Range: $\{1, 3, 4, 8\}$

5)

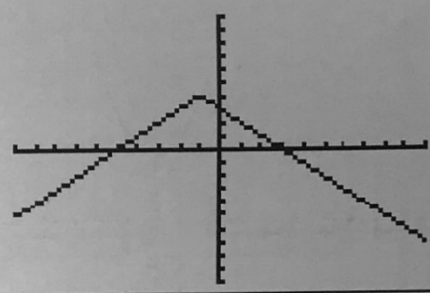


Is this graph a function? Yes ☐ or No ☒

Domain: $x \geq 0$

Range: $\mathbb{R}$

6)



Is this graph a function? Yes ☒ or No ☐

Domain: $\mathbb{R}$

Range: $y \leq 4$

7) What is the name of the test that can be used to determine if a graph is a function?

Vertical line test

Evaluate each function.

$$f(x) = 3x - 4$$

$$g(x) = -2x + 9$$

$$h(x) = x^2 - 2x - 5$$

$$k(x) = -x^2 + 12$$

$$\begin{aligned} 8) f(-5) &= 3(-5) - 4 \\ &= -15 - 4 \\ &= \boxed{-19} \end{aligned}$$

$$\begin{aligned} 9) g(12) &= -2(12) + 9 \\ &= -24 + 9 \\ &= \boxed{-15} \end{aligned}$$

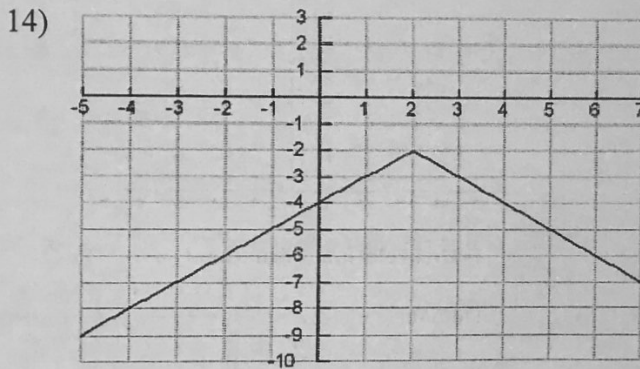
$$\begin{aligned} 10) h(-3) &= (-3)^2 - 2(-3) - 5 \\ &= 9 + 6 - 5 \\ &= 15 - 5 \\ &= \boxed{10} \end{aligned}$$

$$\begin{aligned} 11) k(2) &= -(2)^2 + 12 \\ &= -4 + 12 \\ &= \boxed{8} \end{aligned}$$

$$12) h(m) = \boxed{m^2 - 2m - 5}$$

$$\begin{aligned} 13) f(n+2) &= 3(n+2) - 4 \\ &= 3n + 6 - 4 \\ &= \boxed{3n + 2} \end{aligned}$$

Identify the critical parts of the graph (domain, range, x-intercept, y-intercept, max/min, and vertex).



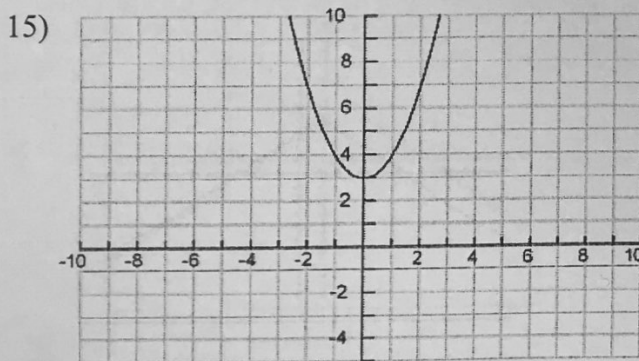
Domain: $\mathbb{R}$

Range: $y \leq -2$

x-intercept(s) none

y-intercept $(0, -4)$

Vertex $(2, -2)$ max or min



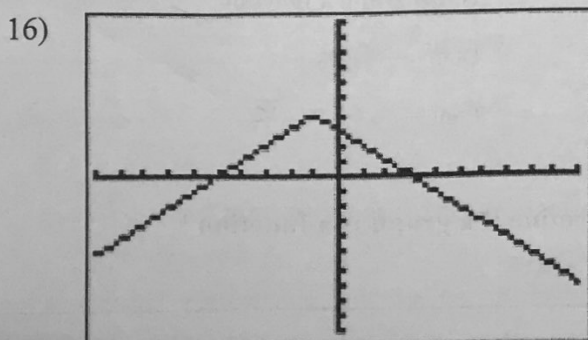
Domain: $\mathbb{R}$

Range: $y \geq 3$

x-intercept(s) none

y-intercept $(0, 3)$

Vertex $(0, 3)$ max or min



Domain: $\mathbb{R}$

Range: $y \leq 4$

x-intercept(s) $(-5, 0)$ $(3, 0)$

y-intercept $(0, 3)$

Vertex $(-1, 4)$ max or min

Graph the following absolute value functions.

17) $y = \frac{1}{2}|x+1|-4$

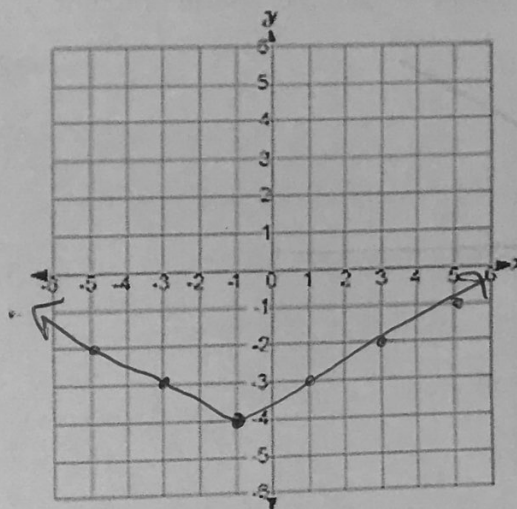
Vertex $(-1, -4)$ max or min

Domain: $\mathbb{R}$

Range: $y \geq -4$

x-intercept(s) $(-9, 0)$ $(7, 0)$

y-intercept $(0, -3.5)$



18) $y = -|x+2|-1$

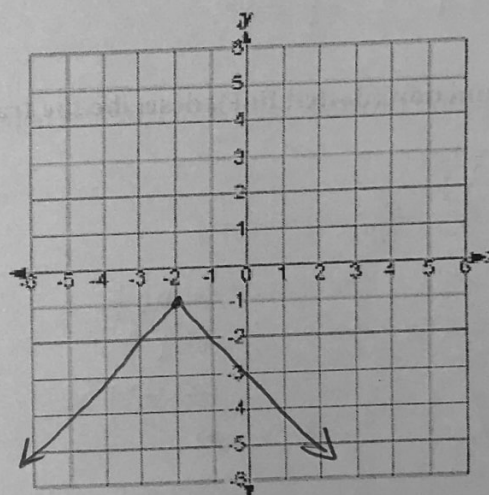
Vertex $(-2, -1)$ max or min

Domain: $\mathbb{R}$

Range: $y \leq -1$

x-intercept(s) none

y-intercept $(0, -3)$



Solve the following absolute value functions.

19) $|x+5|-9=13$

$|x+5|=22$

$x+5=22$ $x+5=-22$

$x=17$

$x=-27$

20) $|2x+3|+5=24$

$|2x+3|=19$

$2x+3=19$

$2x=16$

$x=8$

$2x+3=-19$

$2x=-22$

$x=-11$

21) $3|x-7|-1=-19$

$3|x-7|=-18$

$|x-7|=-6$

no solution

22) $-|3x+6|+3=-12$

$-|3x+6|=-15$

$|3x+6|=15$

$3x+6=15$

$3x=9$

$x=3$

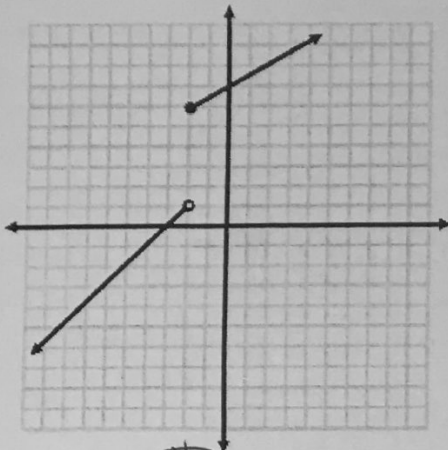
$3x+6=-15$

$3x=-21$

$x=-7$

Find the domain and range of each piece-wise function.

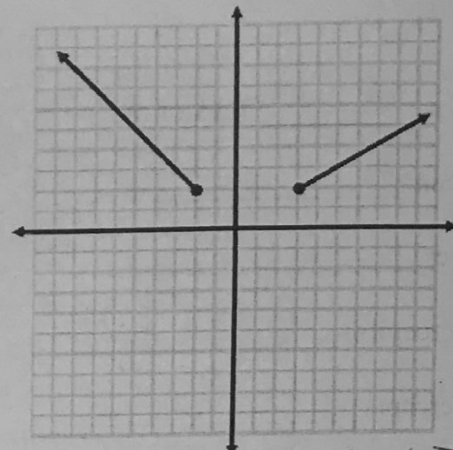
23)



Domain: $\mathbb{R}$

Range: $y < 1 + y \geq 6$

24)

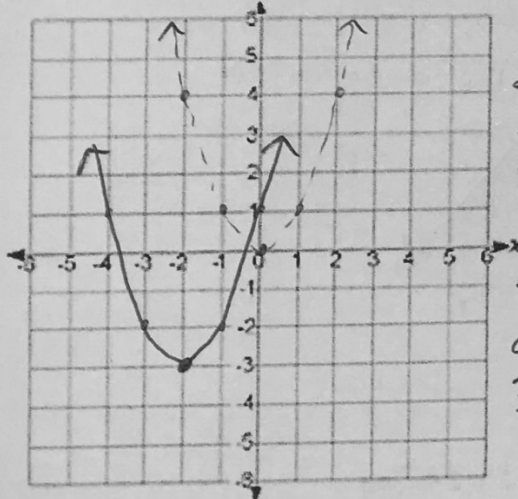


Domain: $x \leq -2 + x \geq 3$

Range: $y \geq 2$

Graph the parent function (dotted line), describe the transformation, and graph the equation (solid line).

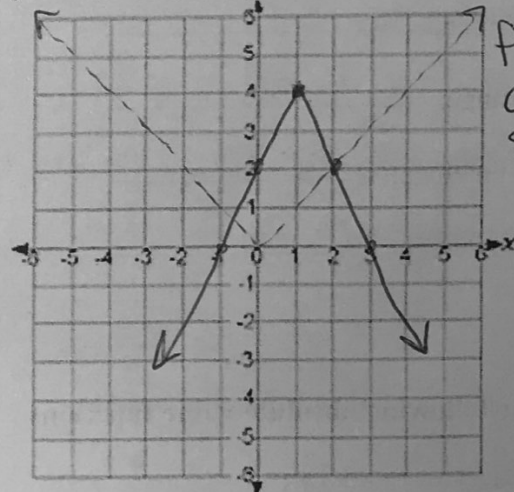
25) $y = (x + 2)^2 - 3$



shift
left
2 units

shift
down
3 units

26) $y = -2|x - 1| + 4$

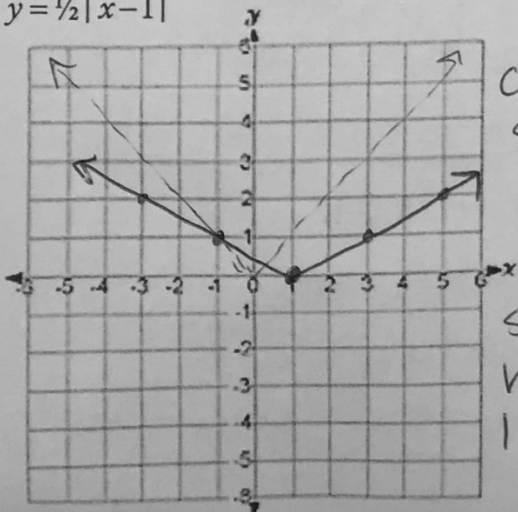


flip over
change
slope

shift
right
1 unit

shift
up
4 units

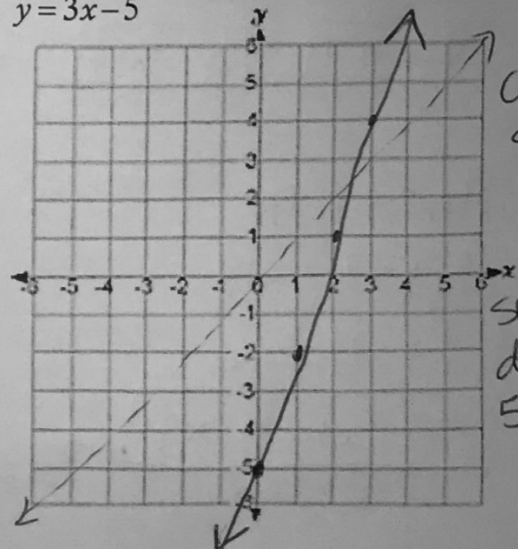
27) $y = \frac{1}{2}|x - 1|$



change
slope

shift
right
1 unit

28) $y = 3x - 5$



change
slope

shift
down
5 units