

SM2 Unit 4B Extra Practice

4.3- Identify the vertex of each function. Describe your process.

1) $f(x) = \frac{1}{2}(x+4)^2 - 4$
 $(-4, -4)$

2) $y = 2(x+1)^2 - 4$
 $(-1, -4)$

3) $y = |x+7| - 1$
 $(-7, -1)$

4) $f(x) = -2|x-3| - 1$
 $(3, -1)$

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

6) $y = -\frac{1}{3}(x-2)^2 + 4$
 $(2, 4)$

7) $g(x) = \frac{1}{3}|x+2| + 9$
 $(-2, 9)$

8) $h(x) = 4|x-8| + 5$
 $(8, 5)$

Explain how each graph below has been shifted and/or stretched from the function $y = x^2$.

9) $y = (x-3)^2 - 4$
right 3, down 4

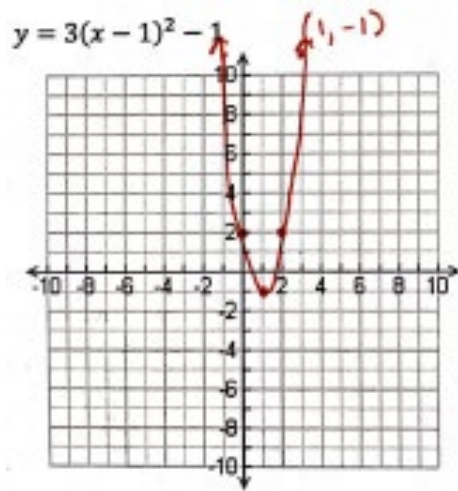
10) $f(x) = 2(x-3)^2 - 3$
right 3, down 3
stretched by 2

11) $y = -3(x-2)^2 + 3$
right 2, up 3
upside down
stretched by 3

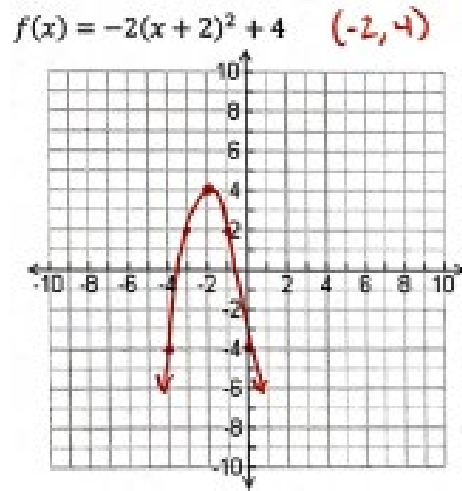
12) $y = \frac{1}{2}(x+3)^2 + 1$
left 3, up 1
shrink by $\frac{1}{2}$

Sketch the graph of each function.

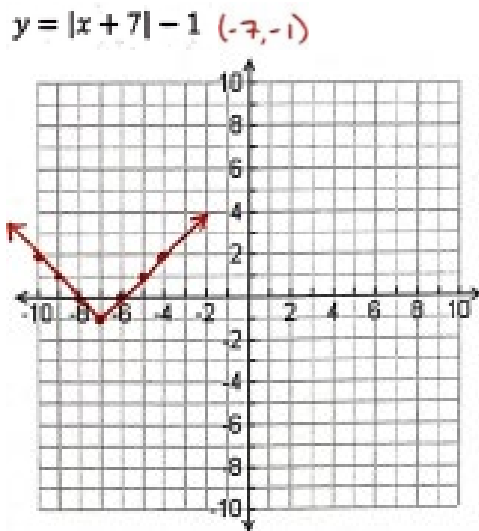
13)



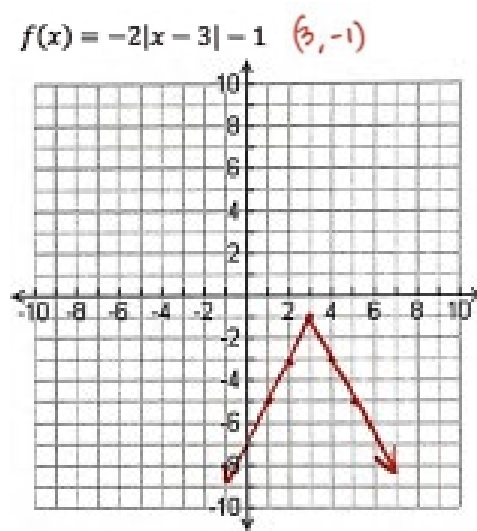
14)



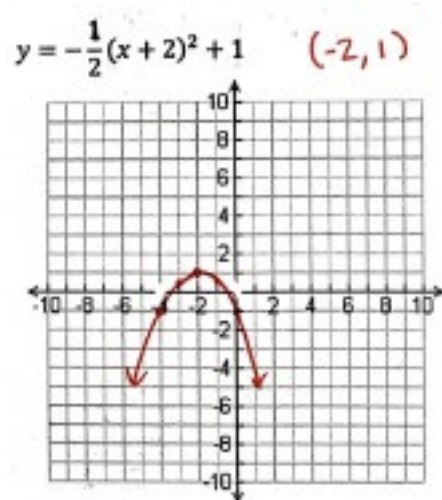
15)



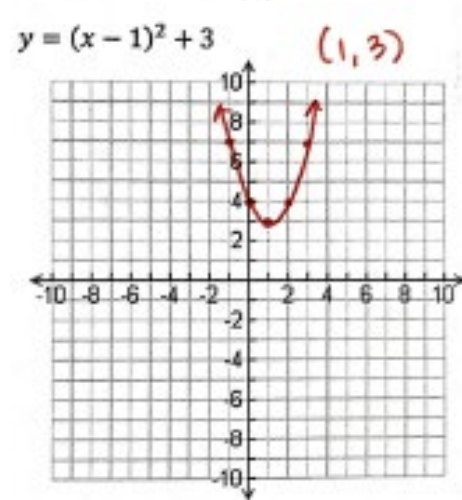
16)



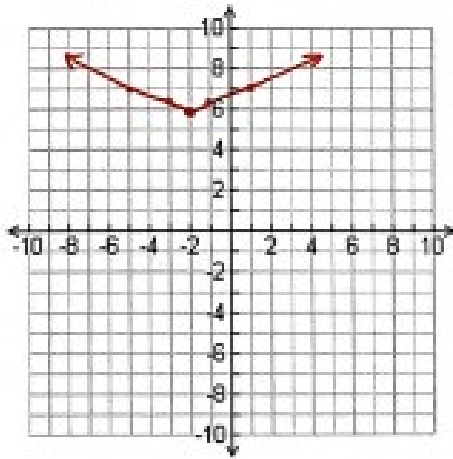
17)



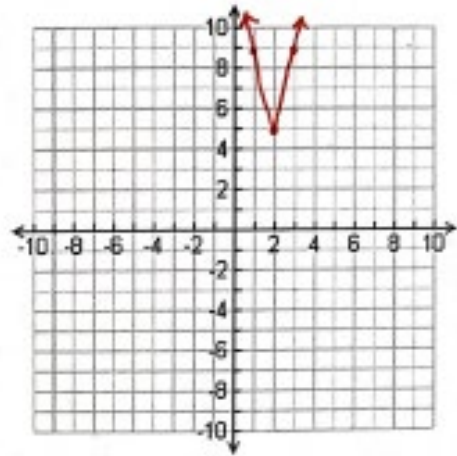
18)



19) $g(x) = \frac{1}{3}|x + 2| + 6$ $(-2, 6)$



20) $h(x) = 4|x - 2| + 5$ $(2, 5)$



4.4- Identify the center and radius of each. Explained how you identified the center and radius.

21) $(x - 1)^2 + (y - 4)^2 = 144$

Center: $(1, 4)$
Radius: 12

22) $(x + 6)^2 + (y - 11)^2 = 41$

Center: $(-6, 11)$
Radius: $\sqrt{41}$

23) $(x + 14)^2 + (y - 1)^2 = 9$

Center: $(-14, 1)$
Radius: 3

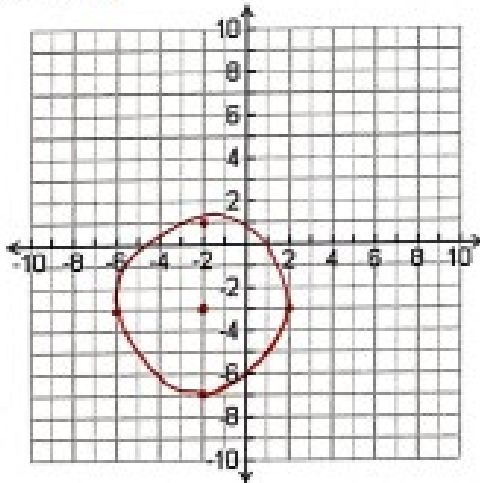
24) $(x - 4)^2 + (y + 16)^2 = 4$

Center: $(4, -16)$
Radius: 2

Identify the center and radius of each. Then sketch the graph.

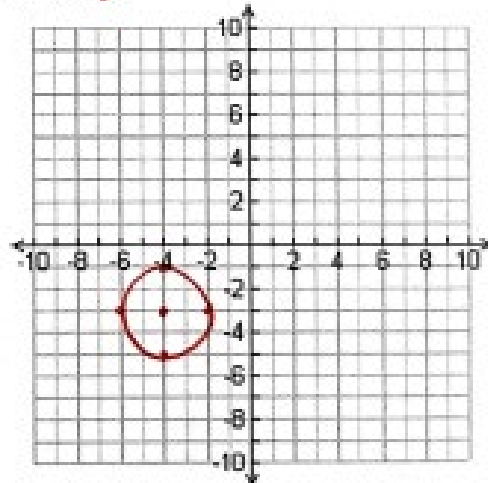
25) $(x + 2)^2 + (y + 3)^2 = 16$

Center: $(-2, -3)$
Radius: 4



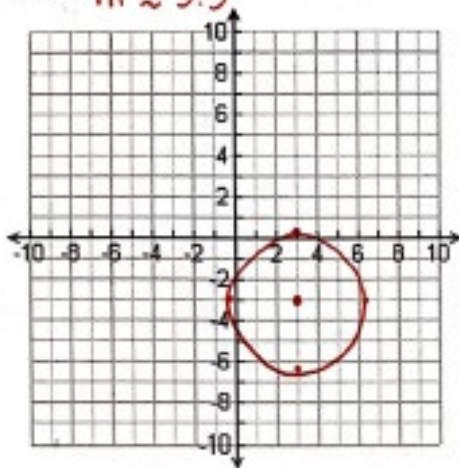
26) $(x + 4)^2 + (y + 3)^2 = 4$

Center: $(-4, -3)$
Radius: 2



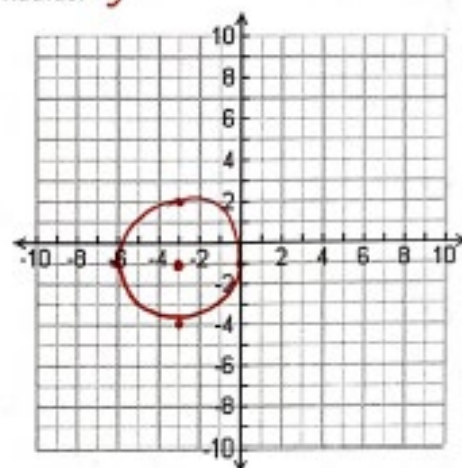
27) $(x - 3)^2 + (y + 3)^2 = 11$

Center: $(3, -3)$
Radius: $\sqrt{11} \approx 3.3$



28) $(x + 3)^2 + (y + 1)^2 = 9$

Center: $(-3, -1)$
Radius: 3



4.5- Graph the piecewise functions. Determine the domain and range of each function.

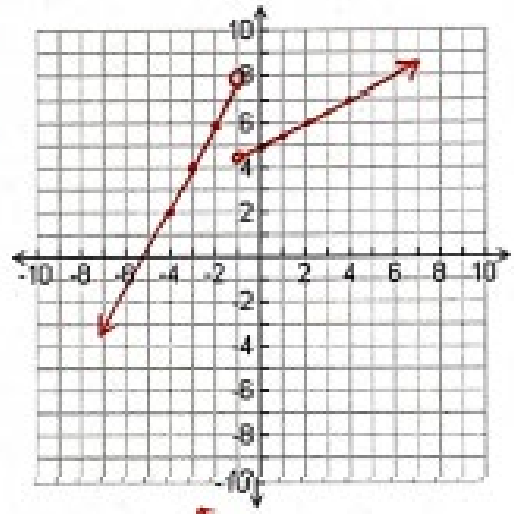
29)

$$y = \begin{cases} 2|x + 5|, & \text{if } x < -1 \\ \frac{1}{2}x + 5, & \text{if } x > -1 \end{cases}$$

Domain:

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

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



30)

$$y = \begin{cases} -2x + 7, & \text{if } x \leq 0 \\ (x - 3)^2 + 1, & \text{if } x > 1 \end{cases}$$

Domain:

$$(-\infty, 0] \cup (1, \infty)$$

Range: $[1, \infty)$

