

Piecewise Functions

Date _____ Period _____

$$\text{Given, } f(x) = \begin{cases} x^2 - 1, & x < 1 \\ 2x, & 1 \leq x < 3, \text{ find the following:} \\ -2(x-4)^2, & x > 3 \end{cases}$$

1) $f(-4)$

2) $f(0)$

3) $f(2)$

4) $f(12)$

5) $f(1)$

6) $f(-7)$

$$\text{Given } f(x) = \begin{cases} |x+5| - 7, & -12 \leq x < -6 \\ (x-2)^2, & -6 < x \leq 7, \text{ find the following:} \\ x^2 + 2x - 5, & x > 7 \end{cases}$$

7) $f(-12)$

8) $f(0)$

9) $f(9)$

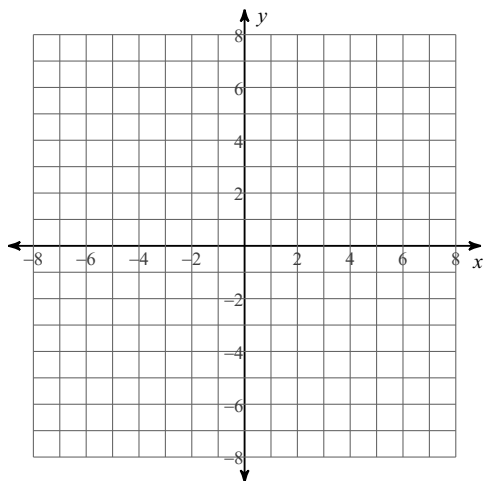
10) $f(-6)$

11) $f(-8)$

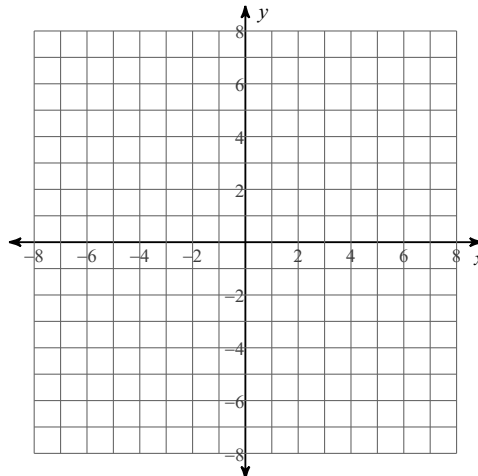
12) $f(2)$

Graph each piecewise function.

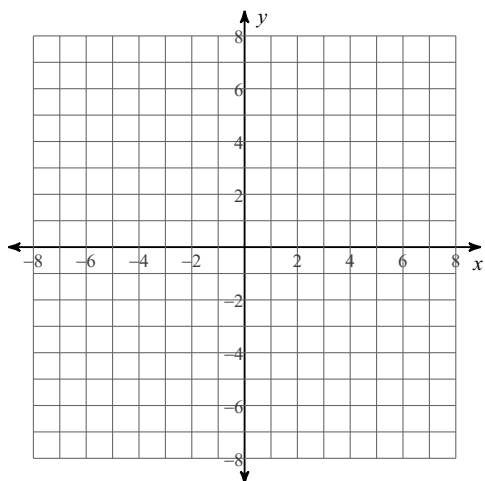
$$13) f(x) = \begin{cases} -(x-2)^2 + 3, & x < 4 \\ 2x - 5, & x \geq 4 \end{cases}$$



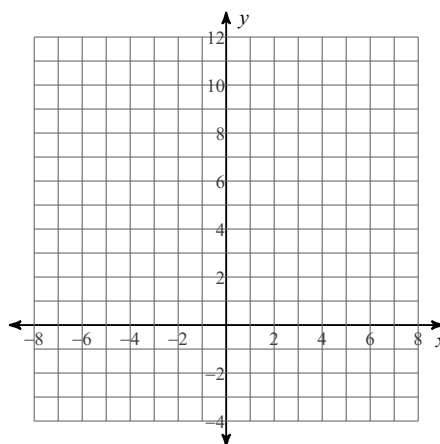
$$14) f(x) = \begin{cases} 2x - 3, & x \leq 0 \\ 2|x - 3|, & x > 0 \end{cases}$$



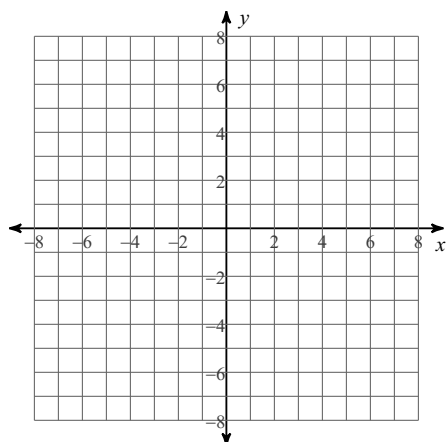
$$15) f(x) = \begin{cases} -|x+1| + 3, & x < 0 \\ -2(x-1)^2 + 2, & x \geq 0 \end{cases}$$



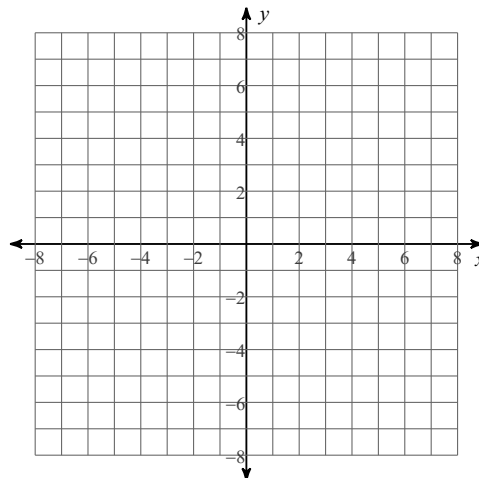
$$16) f(x) = \begin{cases} -\frac{1}{2} \cdot |x+1| + 3, & x < 1 \\ 2(x-2)^2 + 4, & x \geq 1 \end{cases}$$



$$17) f(x) = \begin{cases} -|x+3| + 4, & x < 0 \\ 2|x-4| - 4, & x \geq 0 \end{cases}$$

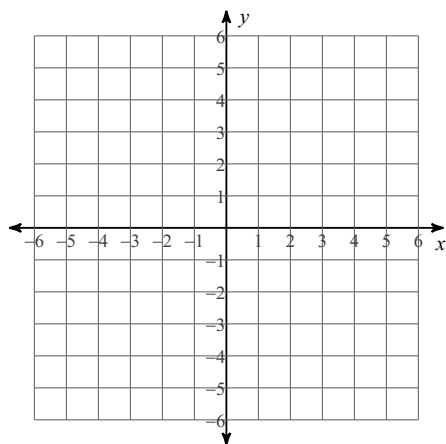


$$18) f(x) = \begin{cases} x^2 - 1, & x < 1 \\ 2x, & 1 \leq x < 3 \\ -2(x-4)^2, & x > 3 \end{cases}$$

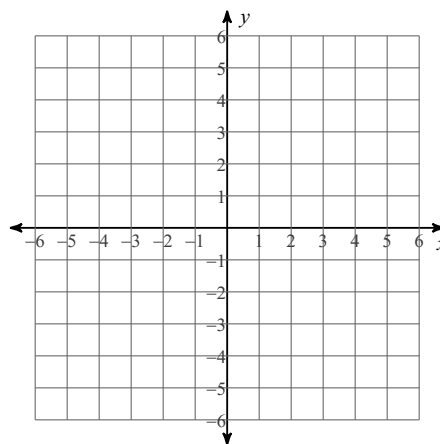


Sketch the graph of the given equation. State the VERTEX, DOMAIN and RANGE.

$$19) y = -2|x+4| + 2$$

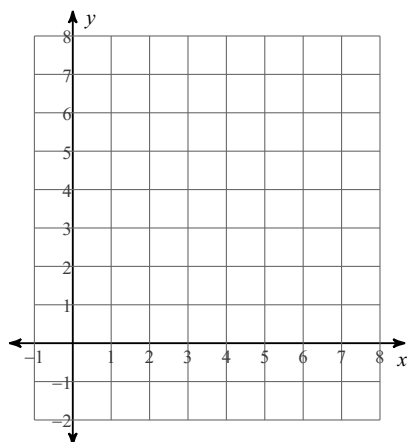


$$20) y = 3|x-3| + 1$$

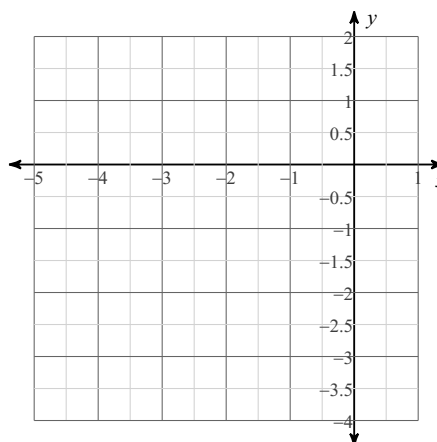


Sketch the graph of each function. State the VERTEX, DOMIN and RANGE.

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



22) $y = -(x + 1)^2 + 1$



Factor each completely.

23) $k^2 - 6k + 5$

24) $n^2 + 2n - 80$

25) $n^2 + 5n$

26) $5x^2 + 30x$

27) $-9x^2 + 25$

28) $-m^2 - 18m - 80$

Find the zeros by factoring.

29) $x^2 + 9x + 20 = 0$

30) $x^2 - x - 12 = 0$