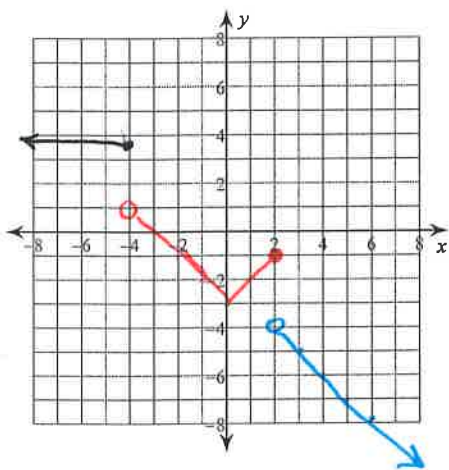


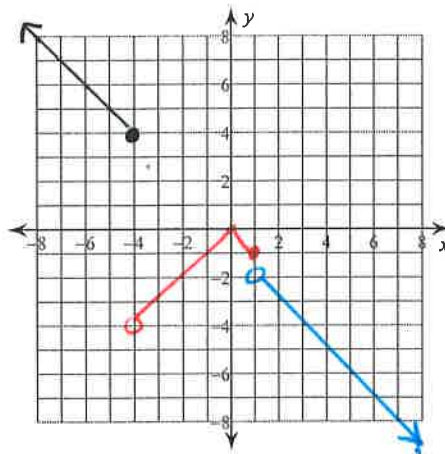
Graphing Piecewise Functions

Sketch the graph of each function.

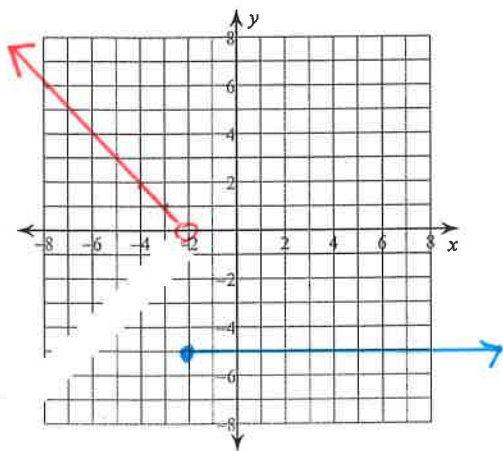
$$1) g(x) = \begin{cases} \frac{1}{x} + 4, & x \leq -4 \quad \bullet \\ |x| - 3, & -4 < x \leq 2 \quad \bullet \\ -x - 2, & x > 2 \quad \bullet \end{cases}$$



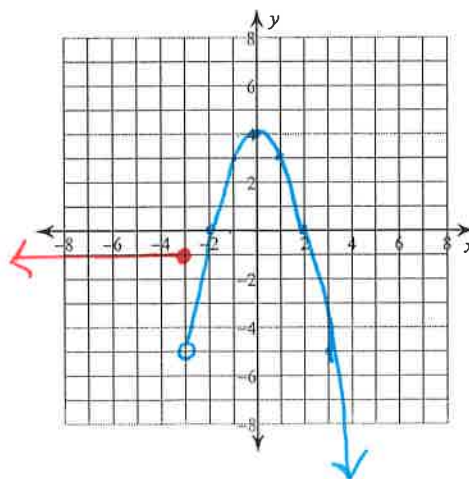
$$2) f(x) = \begin{cases} -x, & x \leq -4 \quad \bullet \\ -|x|, & -4 < x \leq 1 \quad \bullet \\ -x - 1, & x > 1 \quad \bullet \end{cases}$$



$$3) f(x) = \begin{cases} -x - 2, & x < -2 \quad \bullet \\ -5, & x \geq -2 \quad \bullet \end{cases}$$



$$4) g(x) = \begin{cases} -1, & x \leq -3 \quad \bullet \\ 4 - x^2, & x > -3 \quad \bullet \end{cases}$$



Name: Cornely

Evaluate Piecewise Functions Worksheet

Evaluate the piecewise function.

1) $f(x) = \begin{cases} 3x - 5, & x > 4 \\ x^2, & x \leq 4 \end{cases}$

a) $f(7) =$

$$\begin{array}{l} 3(7) - 5 \\ 21 - 5 \\ 16 \end{array} \quad \boxed{(7, 16)}$$

b) $f(4) =$

$$\begin{array}{l} 4^2 = 16 \\ \boxed{(4, 16)} \end{array}$$

c) $f(-3) =$

$$\begin{array}{l} (-3)^2 = 9 \\ \boxed{(-3, 9)} \end{array}$$

2) $f(x) = \begin{cases} -2|x + 1|, & x \leq 1 \\ 3, & 1 < x < 3 \\ 6 - 2x, & x \geq 3 \end{cases}$

a) $f(10) =$

$$\begin{array}{l} 6 - 2(10) \\ 6 - 20 \\ -14 \end{array} \quad \boxed{(10, -14)}$$

b) $f(2) = 3$

$$\boxed{(2, 3)}$$

c) $f(0) =$

$$\begin{array}{l} -2|0 + 1| \\ -2(1) = -2 \\ \boxed{(0, -2)} \end{array}$$

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

a) $f(-3) =$

$$\begin{array}{l} -(-3)^2 - 2(-3) \\ -9 + 6 \\ -3 \end{array} \quad \boxed{(-3, -3)}$$

b) $f(0) =$

$$0 + 2 = 2$$

$$\boxed{(0, 2)}$$

c) $f(-1) =$

$$-1 + 2 = 1$$

$$\boxed{(-1, 1)}$$

4) $g(x) = \begin{cases} -2x - 1, & x \leq 1 \\ -x^2 + 3x - 5, & x > 1 \end{cases}$

a) $g(1) =$

$$\begin{array}{l} -2(1) - 1 \\ -2 - 1 \\ -3 \\ \boxed{(1, -3)} \end{array}$$

b) $g(-2) =$

$$\begin{array}{l} -2(-2) - 1 = \\ 4 - 1 = 3 \end{array}$$

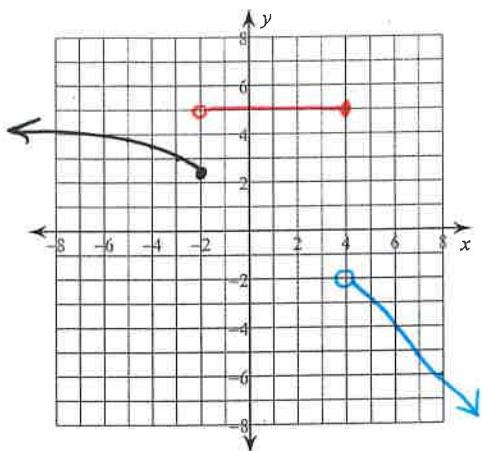
$$\boxed{(-2, 3)}$$

c) $g(0) =$

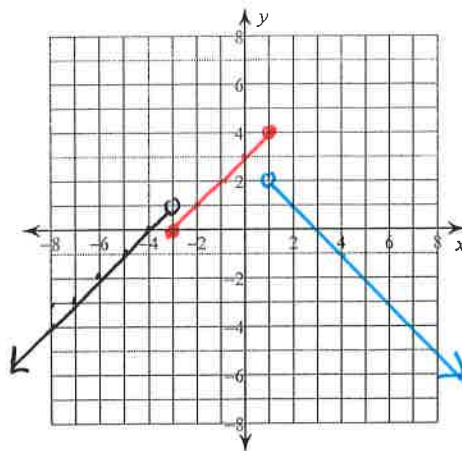
$$\begin{array}{l} -2(0) - 1 \\ 0 - 1 \\ -1 \end{array}$$

$$\boxed{(0, -1)}$$

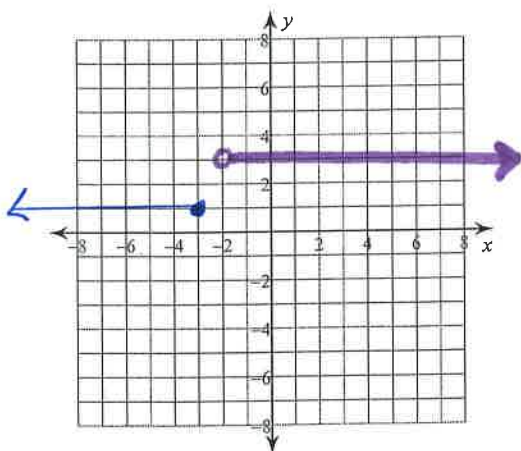
$$5) f(x) = \begin{cases} \sqrt{-3x}, & x \leq -2 \\ 5, & -2 < x \leq 4 \\ -x + 2, & x > 4 \end{cases}$$



$$6) f(x) = \begin{cases} x + 4, & x < -3 \\ |x + 3|, & -3 \leq x \leq 1 \\ -x + 3, & x > 1 \end{cases}$$

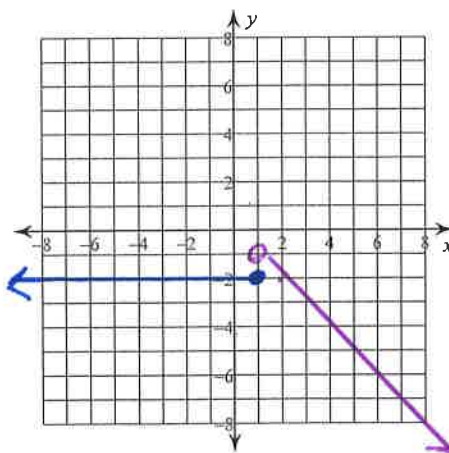


$$7) f(x) = \begin{cases} 1, & x \leq -3 \\ 3, & x > -2 \end{cases}$$



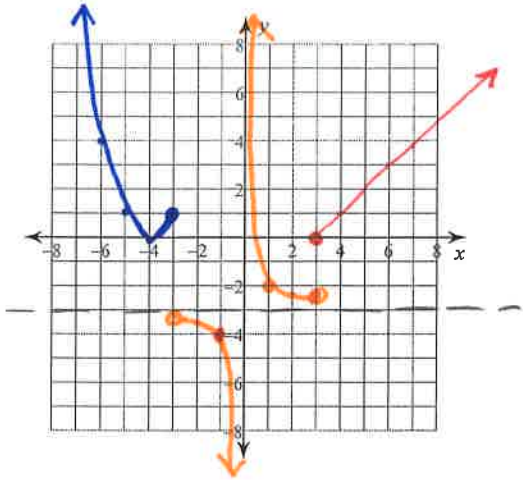
1		3	
x	y	x	y
-3	1 closed	-2	3 open
-4	1	-1	3
-5	1	0	3
		1	3

$$8) f(x) = \begin{cases} -2, & x \leq 1 \\ -|x|, & x > 1 \end{cases}$$

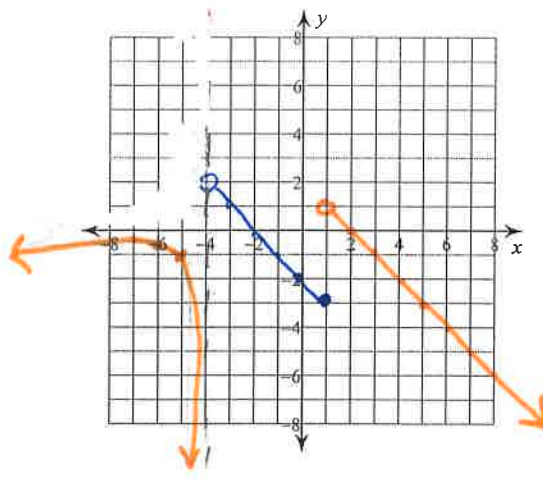


-2		- x	
x	y	x	y
1	-2 closed	1	-1 open
0	-2	2	-2
-1	-2	3	-3
-2	-2	4	-4
-2		⋮	

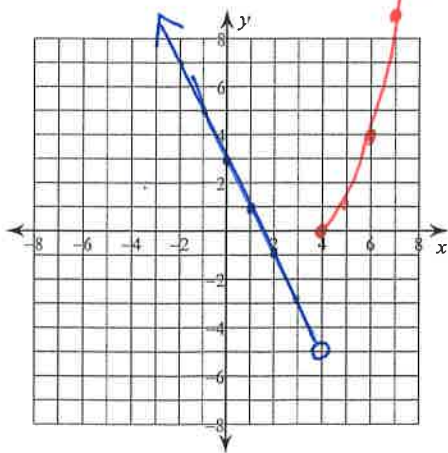
$$9) f(x) = \begin{cases} (x+4)^2, & x \leq -3 \\ \frac{1}{x} - 3, & -3 < x < 3 \\ x - 3, & x \geq 3 \end{cases}$$



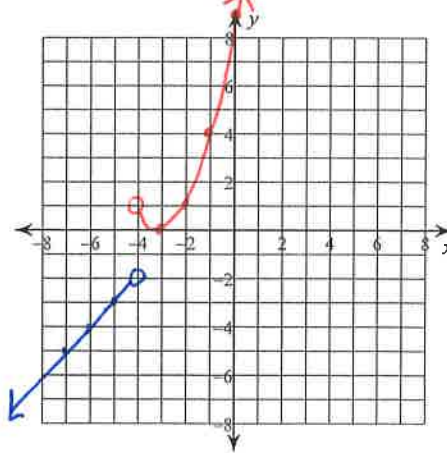
$$10) f(x) = \begin{cases} \frac{1}{x+4}, & x \leq -4 \\ -x - 2, & -4 < x \leq 1 \\ -x + 2, & x > 1 \end{cases}$$



$$11) f(x) = \begin{cases} -2x + 3, & x < 4 \\ (x-4)^2, & x \geq 4 \end{cases}$$



$$12) f(x) = \begin{cases} x + 2, & x < -4 \\ (x+3)^2, & x \geq -4 \end{cases}$$



① • $\frac{1}{x} + 4$

x	y
-4	3.75 closed
-5	3.8
-6	3.83
-7	3.85
-8	3.87
⋮	

• $|x| - 3$

x	y
-4	1 open
-3	0
-2	-1
-1	-2
0	-3
1	-2
2	-1 closed

• $-x - 2$

x	y
2	-4 open
3	-5
4	-6
5	-7
⋮	

② • $-x$

x	y
-4	4 closed
-5	5
-6	6
-7	7
⋮	

• $-|x|$

x	y
-4	-4 open
-3	-3
-2	-2
-1	-1
0	0
1	-1 closed

• $-x - 1$

x	y
1	-2 open
2	-3
3	-4
4	-5
⋮	

③ • $-x - 2$

x	y
-2	0 open
-3	-1
-4	2
-5	3

• -5

x	y
-2	-5 closed
-1	-5
0	-5
1	-5
2	-5

④ • -1

x	y
-3	-1 closed
-4	-1
-5	-1
-6	-1
⋮	

• $4 - x^2$

x	y
-3	-5 open
-2	0
-1	3
0	4
1	3
⋮	

⑤ • $\sqrt{-3x}$

x	y
-2	2.4 closed
-3	3
-4	3.4
-5	3.87

• 5

x	y
-2	5 open
-1	5
0	5
1	5
2	5
3	5
4	5 closed

• $-x + 2$

x	y
4	-2 open
5	-3
6	-4
7	-5
⋮	

⑥ • $x + 4$

x	y
-3	1 open
-4	0
-5	-1
-6	-2

• $|x + 3|$

x	y
-3	0 closed
-2	1
-1	2
0	3
1	4 closed

• $-x + 3$

x	y
1	2 open
2	1
3	0
4	-1
⋮	

⑨ $(x+4)^2$

x	y
-3	1 closed
-4	0
-5	1
-6	4

$\frac{1}{x} - 3$

x	y
-3	-3.3 open
-2	-3.5
-1	-4
0	asymptote
1	-2
2	-2.5
3	-2.667 open

$x-3$

x	y
3	0 closed
4	1
5	2
6	3

⑩

$\frac{1}{x+4}$

x	y
-4	∞ closed
-5	-1
-6	-.5
-7	-.33
-8	-.25

$-x-2$

x	y
-4	2 open
-3	1
-2	0
-1	-1
0	-2
1	-3 closed

$-x+3$

x	y
1	1 open
2	0
3	-1
4	-2
5	-3

⑪

$-2x+3$

x	y
4	-5 open
3	-3
2	-1
1	1
∴	

$(x-4)^2$

x	y
4	0 closed
5	1
6	4
7	9
8	16
9	25
∴	

⑫

$x+2$

x	y
-4	-2 open
-5	-3
-6	-4
-7	-5
-8	-6

$(x+3)^2$

x	y
-4	1 open
-3	0
-2	1
-1	4
0	9