

## 2A.2. Absolute Values of Functions

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Example #1. For  $y = f(x) = x^2 + 2x - 3$ ,

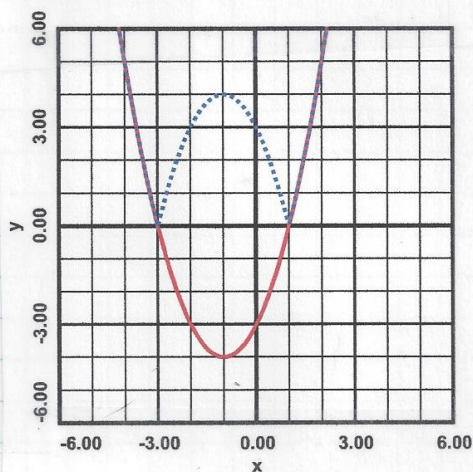
(a) Graph  $y = f(x)$  and  $y = |f(x)|$

(b) State the domain and range of each function  $y = f(x)$  and  $y = |f(x)|$ .

SOLUTION:

$$y+3 = x^2 + 2x \quad , \quad y+4 = x^2 + 2x + 1 \quad , \quad y+4 = (x+1)^2 \quad , \quad \text{vertex} = (-1, -4)$$

x	f(x)	f(x)
-4	5	5
-3	0	0
-2	-3	3
-1	-4	4
0	-3	3
1	0	0
2	5	5



domain:  $-\infty < x < \infty$  range:  $-4 \leq y < \infty$

domain:  $-\infty < x < \infty$  range:  $0 \leq y < \infty$

Example #2. For  $y = f(x) = |x-3| - 2$ ,

(a) Graph  $y = f(x)$  and  $y = |f(x)|$

(b) State the domain and range of each function  $y = f(x)$  and  $y = |f(x)|$ .

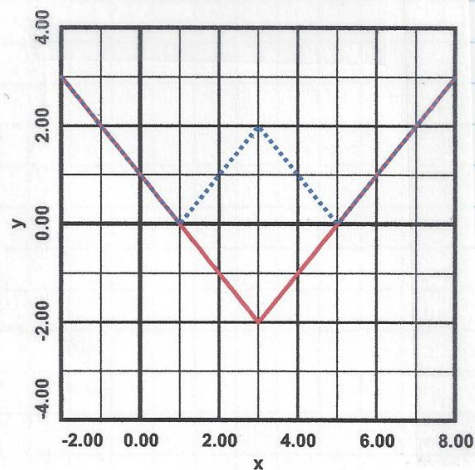
SOLUTION

$$y+2 = |x-3| \quad , \quad \text{vertex} = (3, -2).$$

x	f(x)	f(x)
0	1	1
1	0	0
2	-1	1
3	-2	2
4	-1	1
5	0	0
6	1	1

$$y = |x-3| - 2$$

$$y = ||x-3| - 2|$$



## 2A.2. Absolute Values of Functions

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~~2A.2. Absolute Values of Functions~~  $y = |x-3| - 2$  : domain:  $-\infty < x < \infty$  range:  $-2 \leq y < \infty$

~~2A.2. Absolute Values of Functions~~  $y = ||x-3| - 2|$  : domain:  $-\infty < x < \infty$  range:  $0 \leq y < \infty$