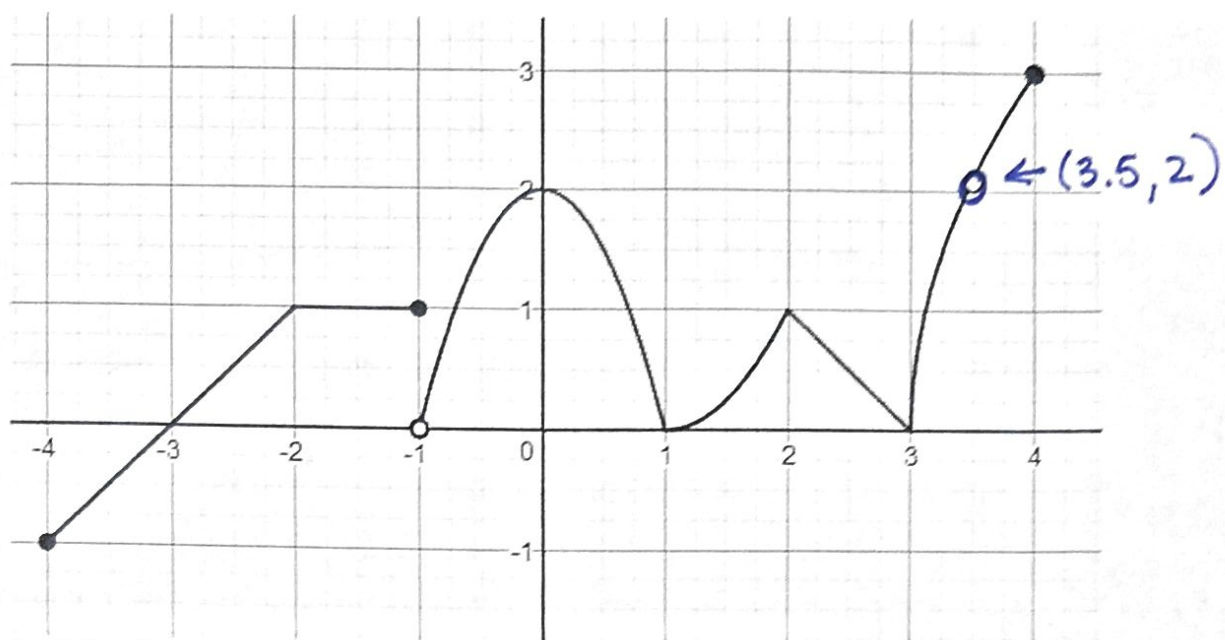


Characteristics of Functions



Using the graph of the above function,  $f(x)$  answer the following questions.

1) Evaluate.

a)  $f(-4)$

-1

b)  $f(-3)$

0

c)  $f(-2)$

1

d)  $f(-1)$

1

e)  $f(0)$

2

f)  $f(1)$

0

g)  $f(2)$

1

h)  $f(3)$

0

i)  $f(4)$

3

j)  $f(3.5)$

undefined

2) For what interval(s) is the function positive?

$(-3, 1) \cup (1, 3) \cup (3, 3.5) \cup (3.5, 4)$

3) For what value(s) of  $x$  is  $f(x) = 0$ ?

$x = -3, 1, 3$

4) For what interval(s) is the function negative?

$[-4, -3]$

5) What are the x-intercepts of the function?

$(-3, 0), (1, 0), (3, 0)$

6) What is the y-intercept of the function?

$(0, 2)$

7) For what interval(s) is the function increasing?

$(-4, -2) \cup (-1, 0) \cup (1, 2) \cup (3, 3.5) \cup (3.5, 4)$

8) For what interval is the function decreasing?

$(0, 1) \cup (2, 3)$

9) For what interval(s) is the function constant?

$[-2, -1]$

10) What are the local extrema?

relative min:  $0$   $(1, 0)$  &  $(3, 0)$   
relative max:  $1 \frac{1}{2}$   $(2, 1)$  &  $(0, 2)$

11) What are the absolute extrema?

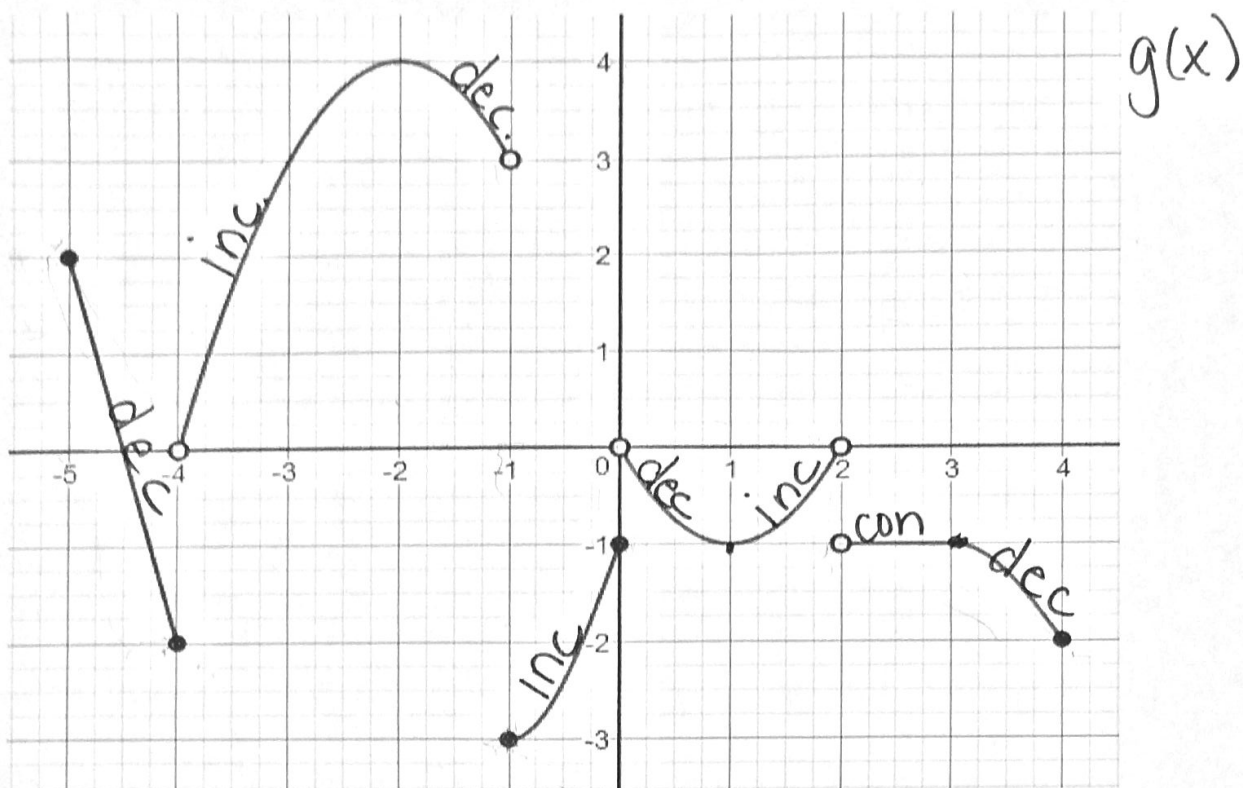
abs min:  $-1$  abs max:  $3$

12) What is the domain?

$[-4, 3.5) \cup (3.5, 4]$

13) What is the range?

$[-4, 3]$



Using the graph of the above function,  $g(x)$  answer the following questions.

14) For what interval(s) is  $g(x) > 0$ ?

$$[-5, -4.5) \cup (-4, -1)$$

15) For what interval(s) is  $g(x) < 0$ ?

$$(4.5, -4] \cup [-1, 2) \cup (2, 4]$$

16) What is the domain?

$$[-5, 2) \cup (2, 4]$$

17) What is the range?

$$[-3, 4]$$

18) What is the x-intercept(s) of the function?

$$(-4.5, 0)$$

19) What is the y-intercept of the function?

$$(0, -1)$$

20) For what interval is the function increasing?

$$(-4, -2) \cup (-1, 0) \cup (1, 2)$$

21) For what interval is the function decreasing?

$$(-5, -4) \cup (-2, -1) \cup (0, 1) \cup (3, 4)$$

22) For what interval is the function constant?

$$(2, 3]$$

23) What are the relative maximum and minimum?

$$\text{rel. min: } -1$$

$$\text{rel. max: } 4$$

24) What are the absolute maximum and minimum?

$$\text{abs. min: } -3$$

$$\text{abs. max: } 4$$

25) Is this function continuous?

No;

non-removable/  
jump discontinuity