

**Practice Problem 1**

A polynomial function  $h$  is given by  $h(x) = ax^3 + bx^2 + cx + d$  where  $a \neq 0$  and  $a, b, c,$  and  $d$  are constants. Which of the following is true about  $h$ ?

- (a) There is not enough information to determine if  $h$  has a global maximum or a global minimum.
- (b)  $h$  has both a global minimum and a global maximum.
- (c)  $h$  has a global maximum or a global minimum, but not both.
- (d)  $h$  has neither a global maximum or a global minimum.

**Practice Problem 2**

Select values of the function  $g$  are shown in the table below. If  $g$  has no other zeros, which is true?

$x$	-4	-1	2	4	6
$g(x)$	-10	0	-3	0	10

- (a)  $g$  has a local minimum at  $(-4, -10)$ .
- (b)  $g$  has a local maximum at  $(-1, 0)$ .
- (c)  $g$  has a local minimum at  $(2, -3)$ .
- (d)  $g$  has a local maximum at  $(6, 10)$ .

**Practice Problem 1 Solution:**

(d)  $h$  has neither a global maximum or a global minimum.

Since the degree is 3, the end behavior goes towards negative infinity in one direction and towards positive infinity in the opposite direction.

**Practice Problem 2 Solution:**

(b)  $g$  has a local maximum at  $(-1, 0)$ .

Since  $g$  increases before  $(-1, 0)$  and decreases after, and no other zeros are shown, this must be a local maximum.

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