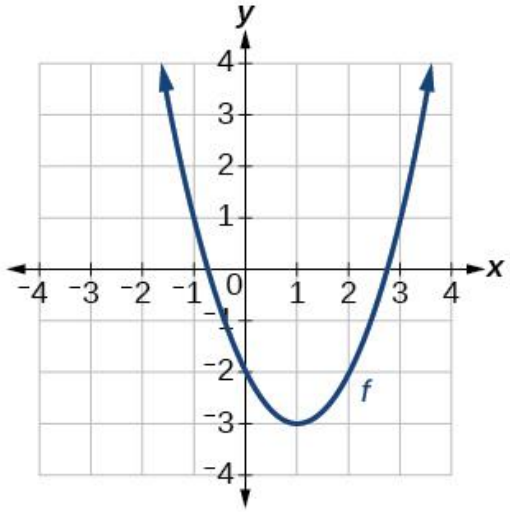
1.3 Answer Key

Practice 3-1-1:

Determine if it's an even or odd function.

a)



Answer: Neither

The graph is not symmetric about the y-axis.

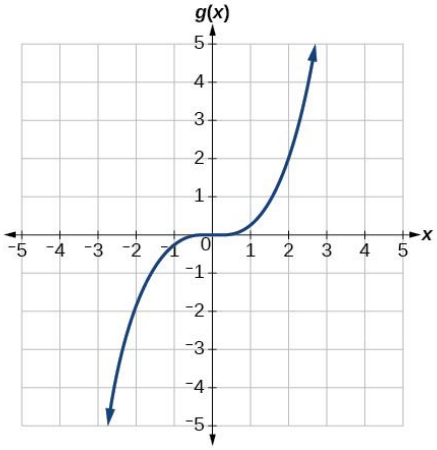
For every point (x,y) on the graph, the corresponding point (−x, y) is not on the graph. For example, (−1,1) is on the graph of f; however, the point (1,1) is not, thus it is not even function.

The graph is also not symmetric about the line y=x.

For every point (x,y) on the graph, the corresponding point (−x,−y) is not on the graph. For instance, (−1,1) is on the graph of f, but the point (1,−1) is not, thus it is not odd function.

Thus, the graph is neither even nor odd.

b)



Answer: Odd

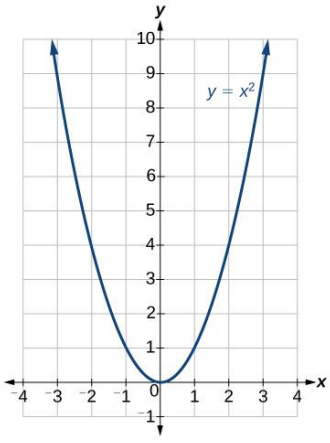
The graph is not symmetric about the y-axis.

For every point (x,y) on the graph, the corresponding point (−x,y) is not on the graph. For example, (−2,-2) is on the graph of f; however, the point (2,-2) is not, thus it is not even function.

The graph is symmetric about the line y = x.

For every point (x,y) on the graph, the corresponding point (−x,−y) is on the graph. For instance, (−2,-2) is on the graph of f, also the point (2,2) is on the graph, thus it is an odd function.

c)



Answer: Even

The graph is symmetric about the y-axis.

For every point (x,y) on the graph, the corresponding point (−x,y) is on the graph. For example, (−2,4) is on the graph of f; the point (2,4) is on the graph, thus it is an even function.

Practice 3-1-2:

Determine if it's an even or odd function algebraically.

a) $f(x) = x^2 - x$

Answer: Neither

Step 1: use $-x$ substitue the x

$$f(-x) = (-x)^2 - (-x)$$

Step 2: simplify the function

$$f(-x) = x^2 + x$$

Step 3: compare $f(-x)$ with $f(x)$, if $f(x) = f(-x)$ even, if $f(x) = -f(-x)$ odd, other than that, netiher. In this question, $f(x) \neq f(-x)$, $f(x) \neq -f(-x)$thus it is it **neither**.

In this question

$$f(x) = x^2 - x$$

And we found

Same

Opposite

$$f(-x) = x^2 + x$$

Since both x^2 term is the same, however the second term $-x$ and $+x$ are opposite, thus it is netiher.

b) $f(x) = 3x^2 - 9$

Answer: Neither

Step1: use $-x$ substitue the x

$$f(-x) = 3(-x)^2 - 9$$

Step 2: simplify the function

$$f(-x) = 3x^2 - 9$$

Step 3: compare $f(-x)$ with $f(x)$, if $f(x) = f(-x)$ even, if $f(x) = -f(-x)$ odd, other than that, netiher. In this question, $f(x) \neq f(-x)$, $f(x) \neq -f(-x)$thus it is it **neither**.

In this question

$$f(x) = 3x^2 - 9$$

And we found

Same

Same

$$f(-x) = 3x^2 - 9$$

Since both $3x^2$ and -9 terms are the same, thus it is even function.

c) $f(x) = 7x^3 - x$

Answer: Odd

Step1: use $-x$ substitue the x

$$f(-x) = 7(-x)^3 - (-x)$$

Step 2: simplify the function

$$f(-x) = -7x^3 + x$$

Step 3: compare $f(-x)$ with $f(x)$, if $f(x) = f(-x)$ even, if $f(x) = -f(-x)$ odd, other than that, netiher. In this question, $f(x) \neq f(-x)$, $f(x) \neq -f(-x)$thus it is it **neither**.

In this question

And we found

$$f(x) = 7x^3 - x$$

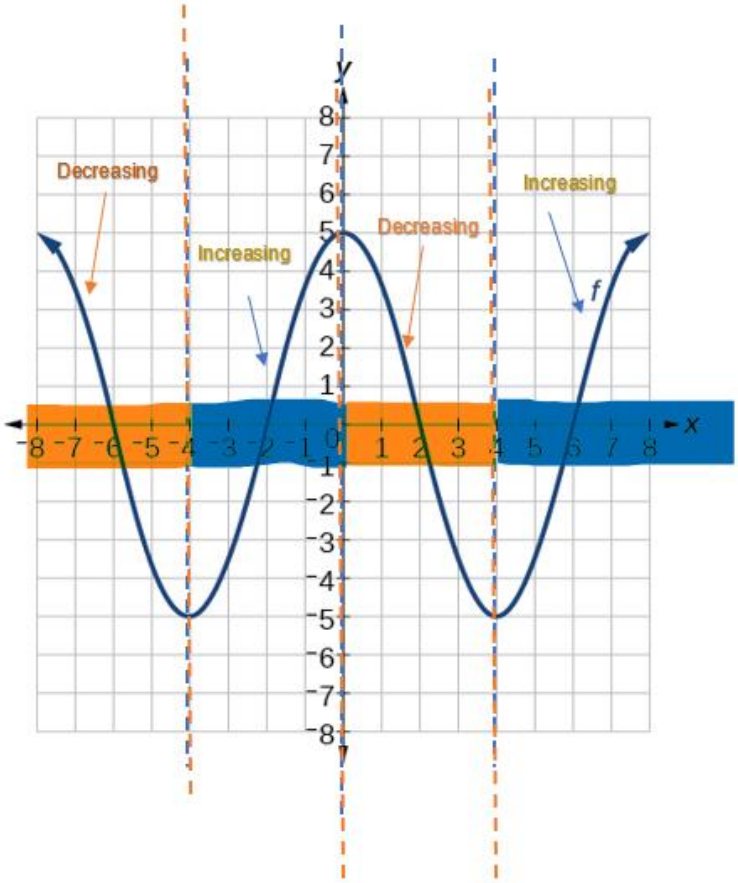
Opposite Opposite

$$f(-x) = -7x^3 + x$$

Since both terms are the opposite, thus it is an odd function.

Practice 3-2-1:

Determine the interval(s) on which the function is increasing, decreasing and constant. Use interval notation, Use commas to separate your answer as needed. If you can't find it, put N/A.



Answer:

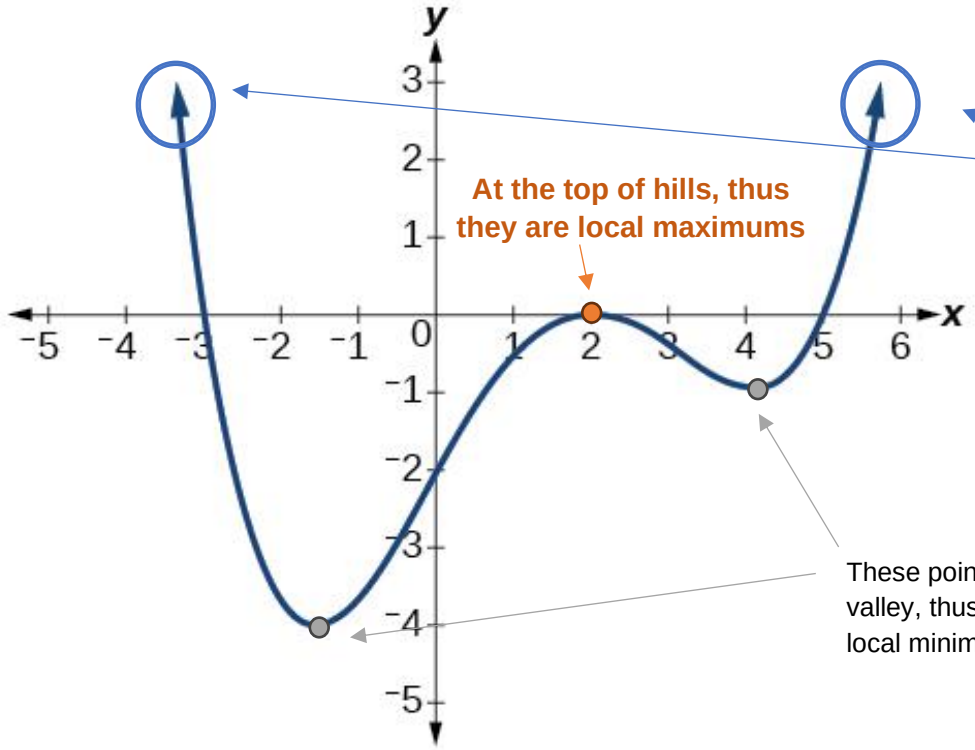
Increasing: (-4,0) (4, ∞)

Decreasing: (-∞, −4), (0,4)

Constant: N/A

Practice 3-3-1:

Use the graphed function to answer the following questions.



Answer:

d) Use the graph find local maximum.

Local maximum: 0

e) Use the graph find local minimum.

Local minimum: -4, -1

f) Use the graph find absolute maximum.

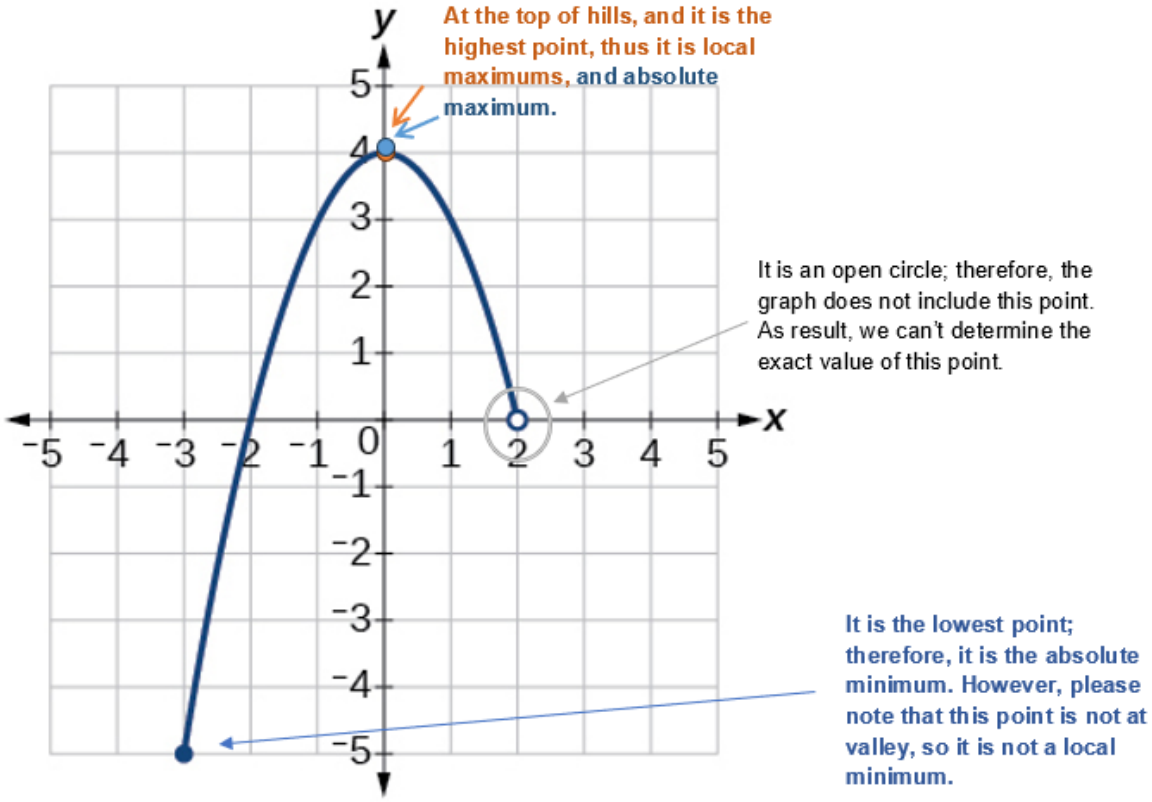
Absolute maximum: N/A

g) Use the graph find absolute minimum.

Absolute minimum: -4

Practice 3-3-2:

Use the graphed function to answer the following questions.



Answer:

a) Use the graph find local maximum.

Local maximum: 4

b) Use the graph find local minimum.

Local minimum: N/A

c) Use the graph find absolute maximum.

Absolute maximum: 4

d) Use the graph find absolute minimum.

Absolute minimum: -5