

Graphical Features

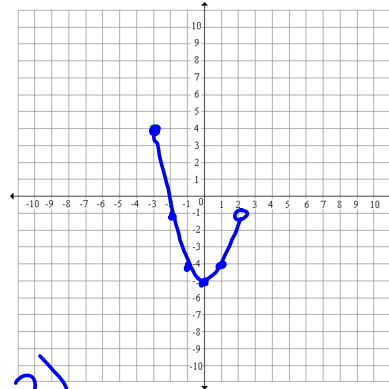
Do Now:

Graph the function over the restricted interval

(Create a table of values)

$$f(x) = x^2 - 5 ; -3 \leq x < 2$$

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



What is the domain?

$$D = -3 \leq x < 2 \text{ OR } D = [-3, 2)$$

What is the range?

$$-5 \leq y \leq 4 \quad [-5, 4]$$

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Graphical Features

Minimum

the lowest output value
y-value
(sometimes "absolute")

Maximum

the highest output value
y-value
(sometimes "absolute")

Relative Minimum

"Turning Point" (dip)
the graph changes from
negative to positive slopes

Relative Maximum

"Turning Point" (peak)
the graph changes from
positive to negative slopes

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Graphical Features

Increasing

the interval of x values between the turning points looks like a positive slope

NOT INCLUSIVE

Decreasing

the interval of x values between the turning points looks like a negative slope

NOT INCLUSIVE

Positive

the interval of x values above the x -axis

NOT INCLUSIVE

Negative

the interval of x values below the x -axis

NOT INCLUSIVE

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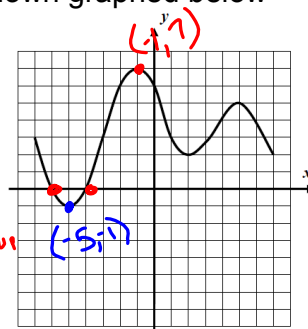
Graphical Features

Exercise #1: The function $y = f(x)$ is shown graphed below over the interval $-7 \leq x \leq 7$. Domain

(a) Find the minimum and maximum values of the function. State the values of x where they occur as well.

Minimum Value
 $y = -1$
 $(-5, -1)$

Maximum Value
 $y = 7$
 $(-1, 7)$



(b) What is the y -intercept of the function? Explain why a function cannot have more than one y -intercept.

$y = 6$

More than one y -intercept would make it not a function because it would fail vertical line test

(c) Give the x -intercepts of the functions. These are also known as the functions **zeroes** because they are where $f(x) = 0$.

$x = -4$ & -6

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Graphical Features

(d) Would you characterize the function as **increasing** or **decreasing** on the domain interval $-5 \leq x \leq -1$?

Explain your choice.

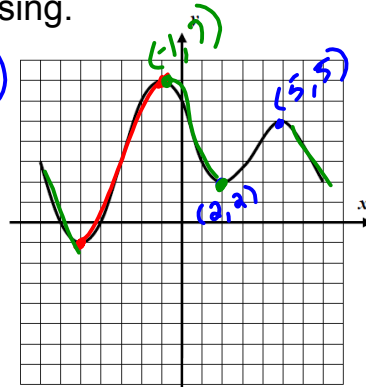
increasing
graph is going up
positive slope

y-values are increasing

(e) One additional interval over which the function is increasing and over which it is decreasing.

Increasing: $2 < x < 5$ OR $(2, 5)$

Decreasing: $-1 < x < 2$ OR $(-1, 2)$

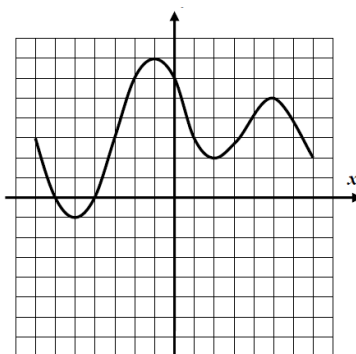


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Graphical Features

(f) The following points are known as **turning points**. Each can be classified as a **relative maximum** or a **relative minimum**. State which you think each is.

$(-5, -1)$	$(-1, 7)$	$(2, 2)$	$(5, 5)$
relative minimum	relative minimum	relative minimum	relative minimum
or	or	or	or
relative maximum	relative maximum	relative maximum	relative maximum



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