

Happy Monday, September 19!

Do Now:

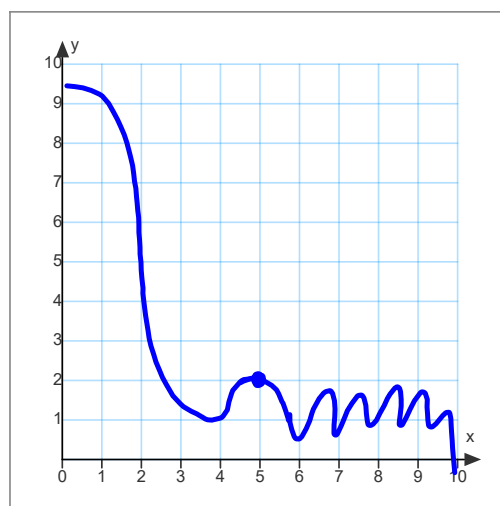
1) Clean out folders

2) Sketch a graph with:

-A local max of ~~5~~² at $x=$ ~~2~~⁵

-Decreasing from $(-\infty, 4)$

this is the type of guy you read about
in math problems



Homework Solutions:

$$f(x) = \frac{x-2}{x+4}$$

$$\lim_{x \rightarrow \infty} f(x) = 1$$

$$\lim_{x \rightarrow -\infty} f(x) = 1$$

$$f(x) = -5x^4 + 6x^2 - 7$$

$$\lim_{x \rightarrow \infty} f(x) = -\infty$$

$$\lim_{x \rightarrow -\infty} f(x) = -\infty$$

$$f(x) = \frac{5x}{x^2 - 4}$$

$$\lim_{x \rightarrow \infty} f(x) = 0$$

$$\lim_{x \rightarrow -\infty} f(x) = 0$$

$$f(x) = \frac{3x}{x^2 + 1}$$

$$\lim_{x \rightarrow \infty} f(x) = 0$$

$$\lim_{x \rightarrow -\infty} f(x) = 0$$

$$g(x) = -3x^3 + 2x + 1$$

$$\lim_{x \rightarrow \infty} g(x) = -\infty$$

$$\lim_{x \rightarrow -\infty} g(x) = \infty$$

$$h(x) = x^5 + 10x - 7$$

$$\lim_{x \rightarrow \infty} h(x) = \infty$$

$$\lim_{x \rightarrow -\infty} h(x) = -\infty$$

$$f(x) = 4x^4 + 3x^2 - 6x$$

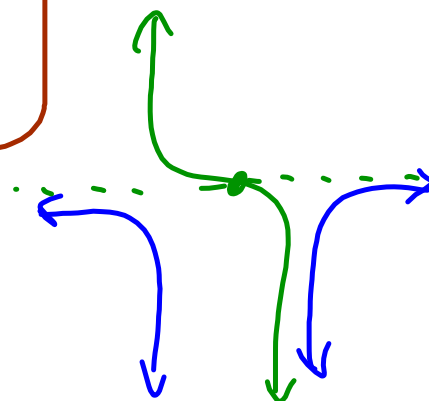
$$\lim_{x \rightarrow \infty} f(x) = \infty$$

$$\lim_{x \rightarrow -\infty} f(x) = \infty$$

$$g(x) = -3x^{200} + 4x - 7$$

$$\lim_{x \rightarrow \infty} g(x) = -\infty$$

$$\lim_{x \rightarrow -\infty} g(x) = -\infty$$



Max/Min

100
~~200~~
~~300~~
400

Increase/
Decrease

100
~~200~~
300
~~400~~

Continuity

~~100~~
~~200~~
~~300~~
400

End
Behavior

~~100~~
~~200~~
300
400

Continuity for 100

Is the function
continuous or not?
If not, list where the
discontinuities are
located and classify
them.

$$f(x) = \frac{x^2 - 4}{x + 2}$$

$x = -2$

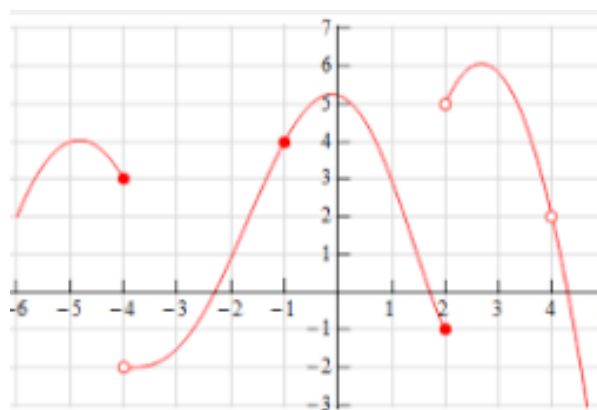
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Continuity for 300

Over what interval(s)
is this function
continuous?

$$(-\infty, -4) \cup (-4, 2) \\ \cup (2, 4) \cup (4, \infty)$$



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Continuity for 400

Draw a function with:

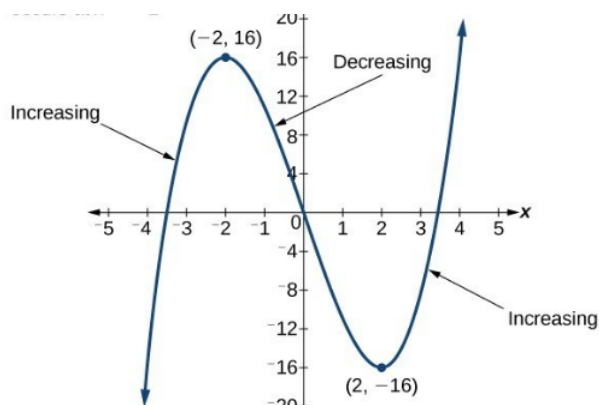
- Jump discontinuity at $x=3$
- Infinite discontinuity at $x = -7$
- Removable discontinuity at $x=11$

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Max/Min for 100

What are the maxima and minima of this graph?



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Max/Min for 200

What are the maxima and minima of this graph?

$$g(x) = \frac{3x^3 + 5}{2x}$$

min 3.98 at .94

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Max/Min for 300

Continuous

If a graph is increasing from $(-3, 5)$,

constant from $(5, \infty)$, and

decreasing from $(-\infty, -3)$,

what can you say about the point $(-3, 7)$?

local min
of 7 at $x = -3$

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Max/Min for 400

What are the
maxima and minima
of this graph?

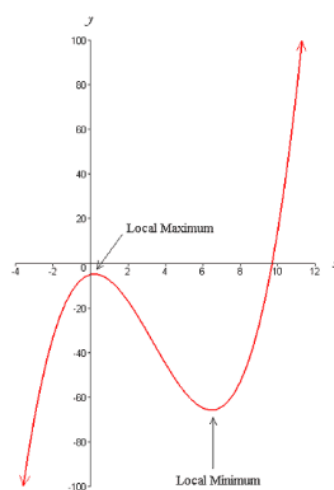
$$g(x) = \sin(x)$$

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Increase/Decrease for 100

Describe the intervals of increase, decrease, and constant for the function.



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Increase/Decrease for 200

Describe the intervals of increase, decrease, and constant for the function.

$$f(x) = 7(x - 2)^3$$

$$\text{inc: } (-\infty, \infty)$$

$$(-\infty, 2) \cup (2, \infty)$$

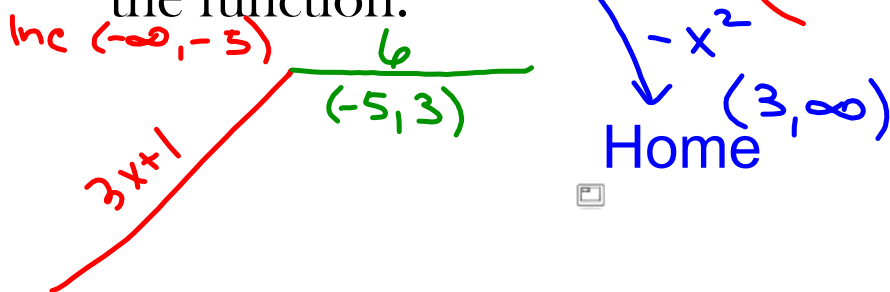
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Increase/Decrease for 300

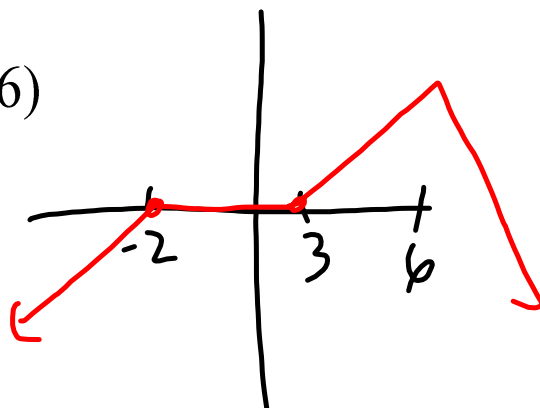
Describe the intervals of increase, decrease, and constant for the function.

$$f(x) = \begin{cases} 3x + 1 & \text{if } x < -5 \\ 6 & \text{if } -5 \leq x \leq 3 \\ -x^2 & \text{if } x > 3 \end{cases}$$



Increase/Decrease for 400

Draw a function that is
increasing on $(-\infty, -2) \cup (3, 6)$
constant on $(-2, 3)$
decreasing on $(6, \infty)$



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End Behavior for 100

Describe the end behavior of the function

$$f(x) = \frac{4x^4 - 7}{3}$$

$$\lim_{x \rightarrow \infty} f(x) = \infty$$

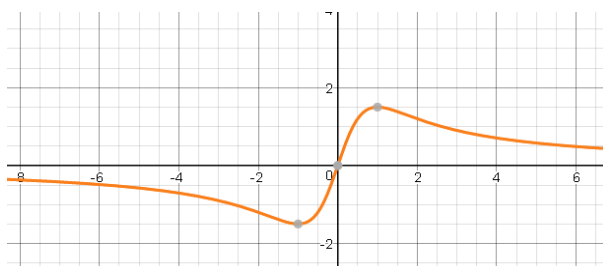
$$\lim_{x \rightarrow -\infty} f(x) = \infty$$

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End Behavior for 200

Describe the end behavior of the function



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End Behavior for 300

Describe the end behavior of the function

$$f(x) = 7x$$

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End Behavior for 400

Draw a function with

$$\lim_{x \rightarrow \infty} f(x) = \infty$$

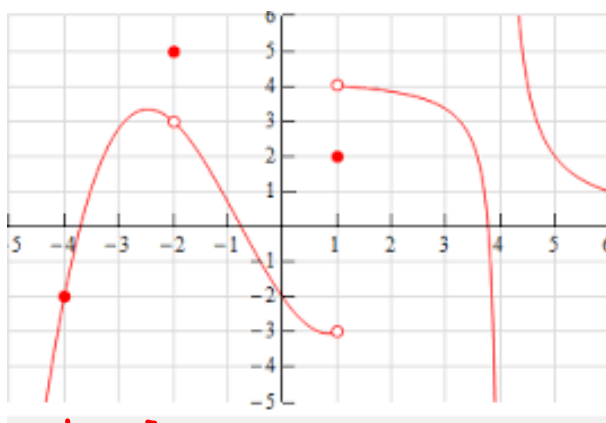
$$\lim_{x \rightarrow -\infty} f(x) = 0$$

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Continuity for 200

Is the function continuous or not?
If not, list where the discontinuities are located and classify them.



Jump at $x = -2$ Inf $x = 4$
Jump $x = 1$ Home

