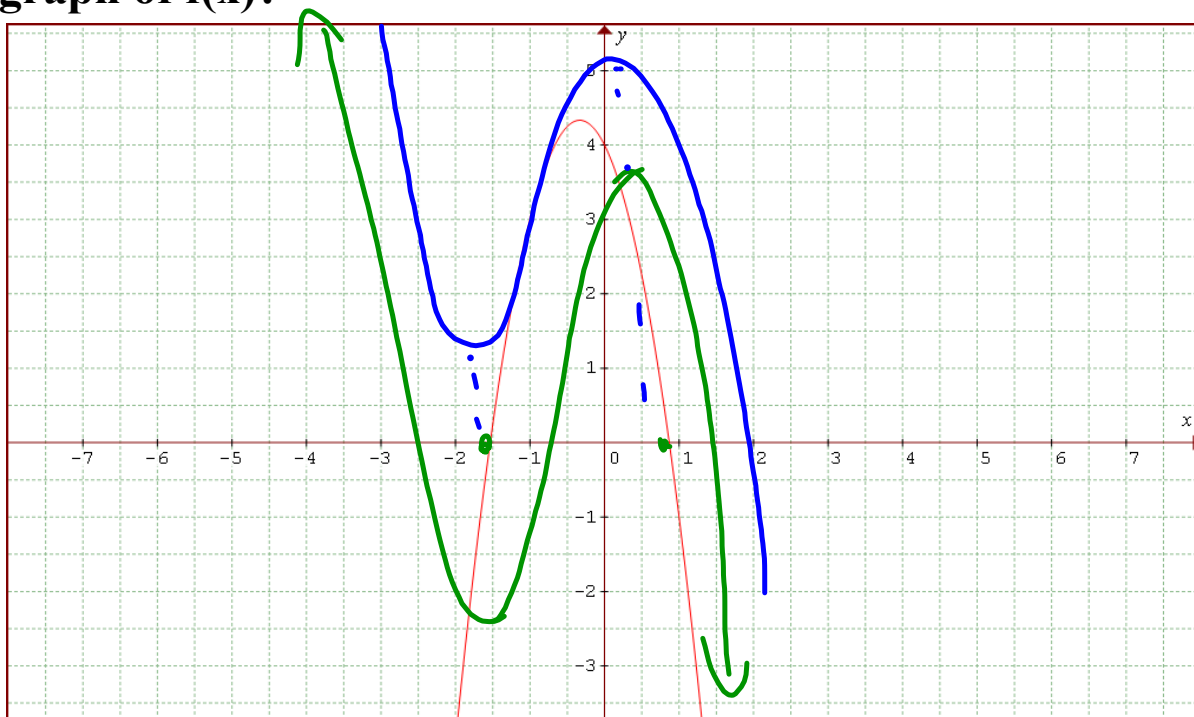




A derivative function, f' is shown below. Sketch a possible graph of $f(x)$?



Calculus 120

Unit 1: Rate of Change and Derivatives

February 20, 2018: Day #10

1. Test on Thursday

2. Assignment Due

3. Return Quiz

3. Page 105-106 #13, 14, 15, 16, 21, 22, 26a

Curriculum Outcomes

C1. Explore the concepts of average and instantaneous rate of change.

C2. Determine the derivative of a function by applying the definition of derivative.

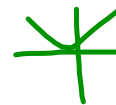
Ex: Determine the values of x for which the following functions are not differentiable? Provide reasoning.

$$y = \frac{1}{x-2}$$

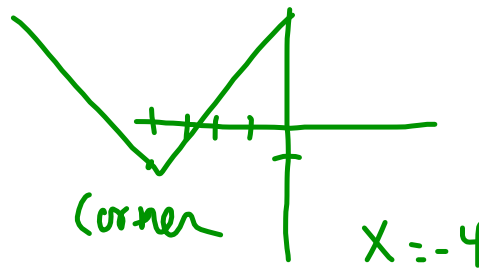
$$x = 2$$

Vertical Asymptote
P.O.I.)

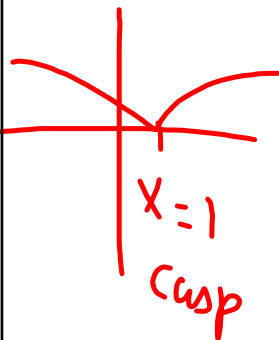
$$y = |x|$$



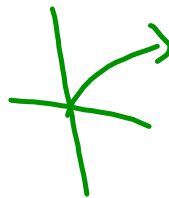
$$y = |x+4| - 1$$



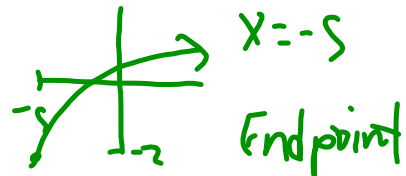
$$y = (x-1)^{\frac{2}{3}}$$



$$\sqrt{x}$$



$$y = 2\sqrt{x+5} - 2$$



What are the 5 types of situations where a relation is not differentiable?

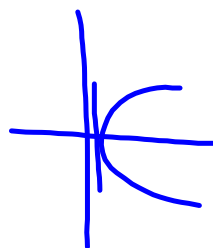
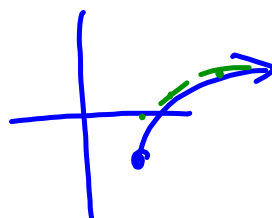
1. P.O.D

2. Endpoints

3. Corners

4. Cusps

5. Vertical Tangents

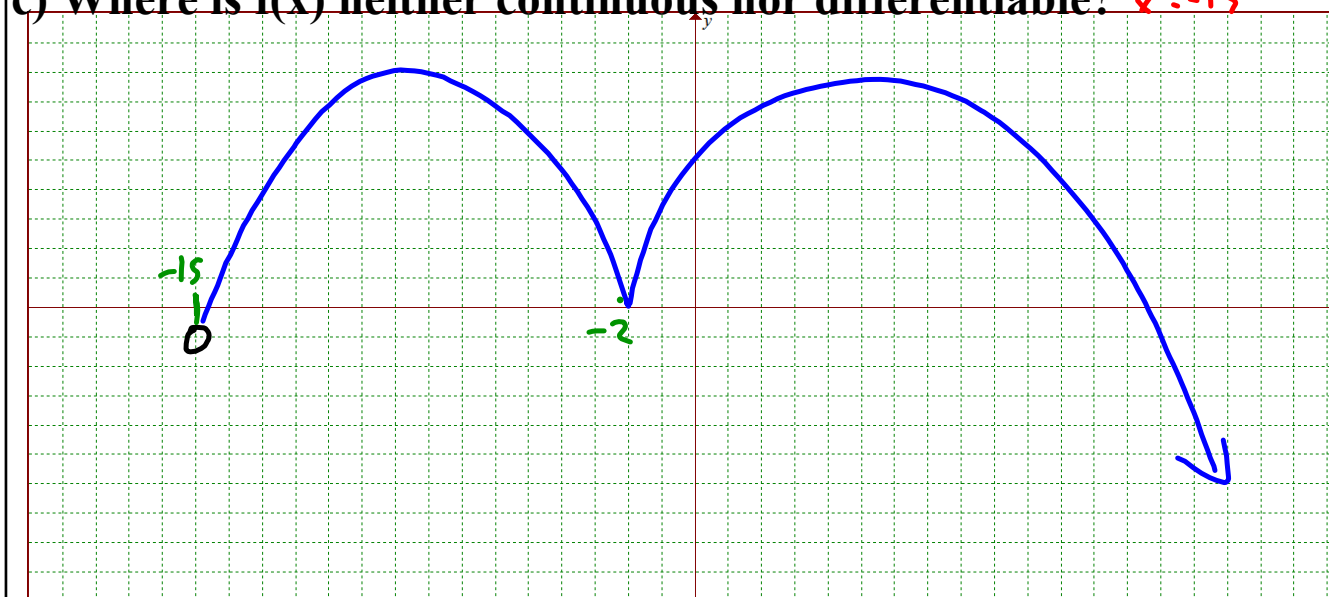


For the graph below:

a) Over which intervals is $f(x)$ differentiable $(-15, 2) \cup (-2, 4)$

b) Where is $f(x)$ continuous, but not differentiable? $x = -2$

c) Where is $f(x)$ neither continuous nor differentiable? $x = -15$



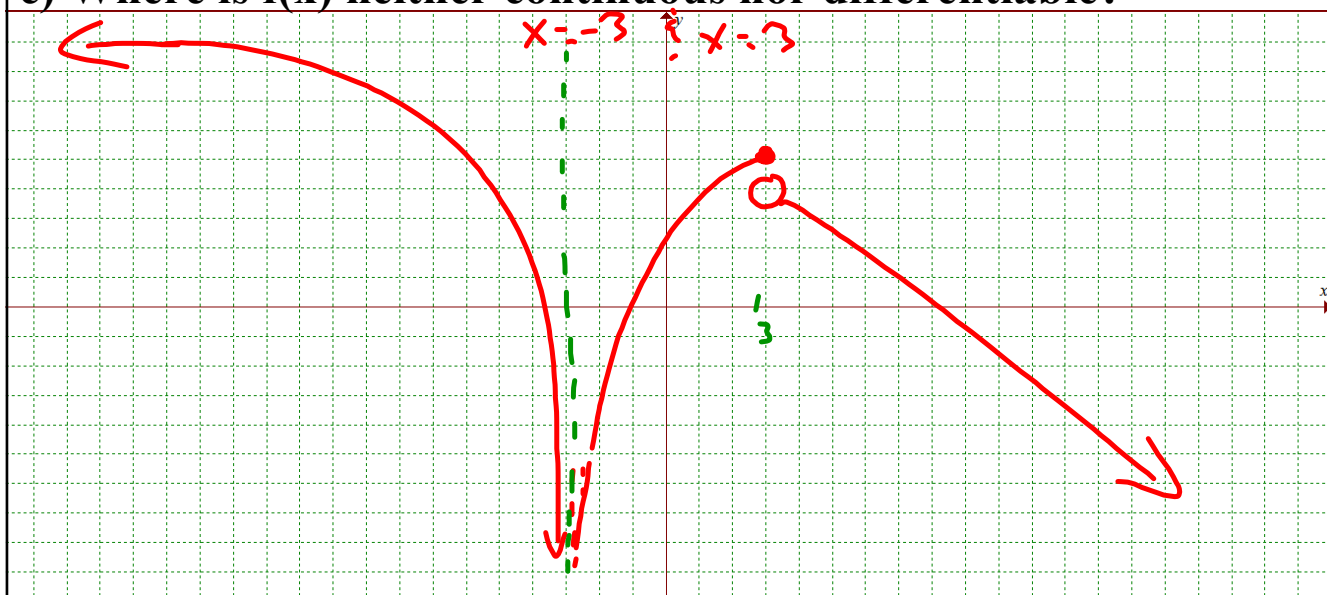
For the graph below:

a) Over which intervals is $f(x)$ differentiable

$$(-\infty, -3) \cup (-3, 3) \cup (3, \infty)$$

b) Where is $f(x)$ continuous, but not differentiable? *nowhere*

c) Where is $f(x)$ neither continuous nor differentiable?



Test Review:

AROC slope = $\frac{f(x_1) - f(x_2)}{x_1 - x_2}$

IROC (not with decimals...only using derivatives)

Equation of a tangent line at a point

Equation of a normal line at a point

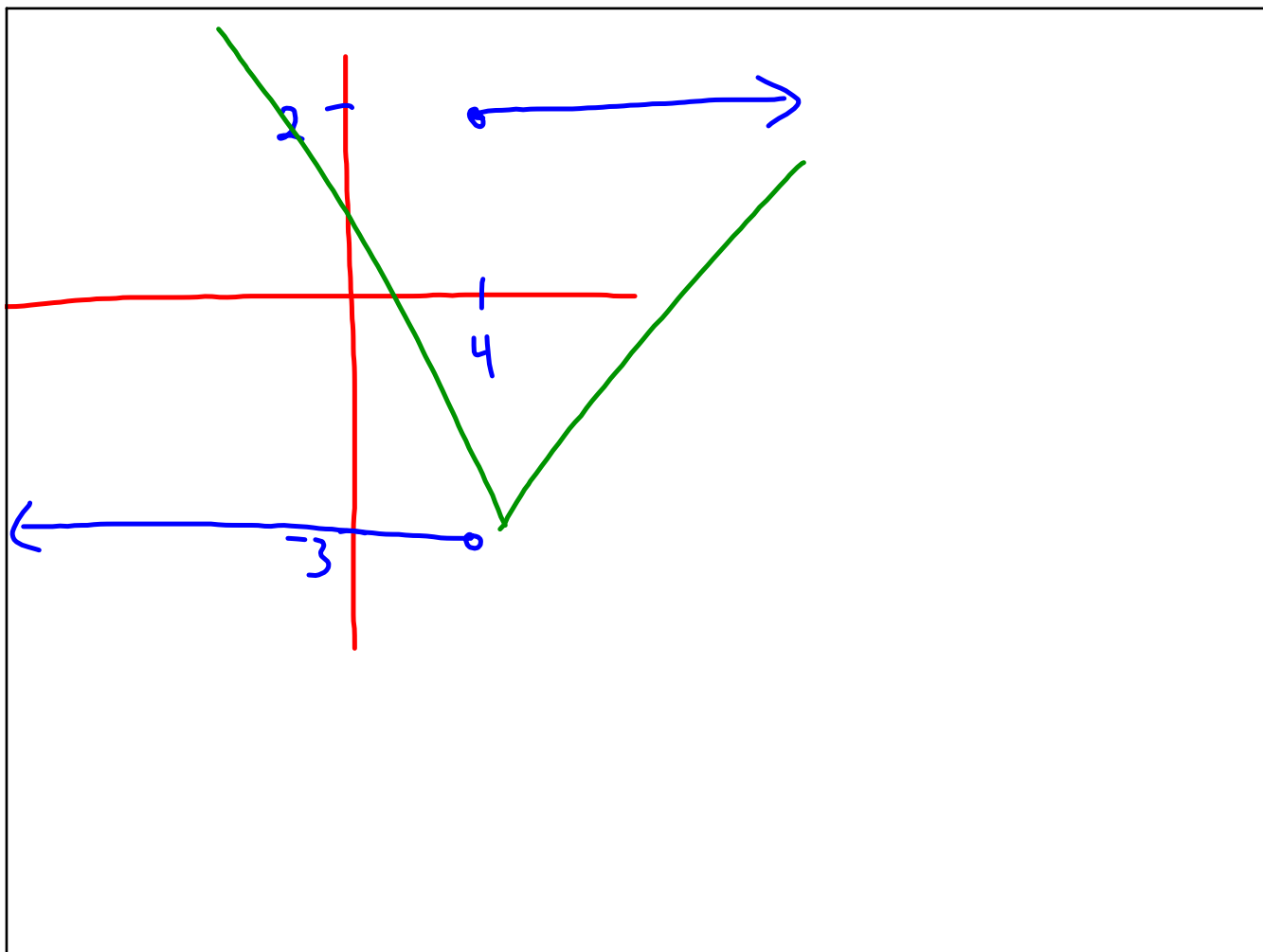
Derivative/IROC at a point $\lim_{x \rightarrow a} \frac{f(x) - f(a)}{x - a}$

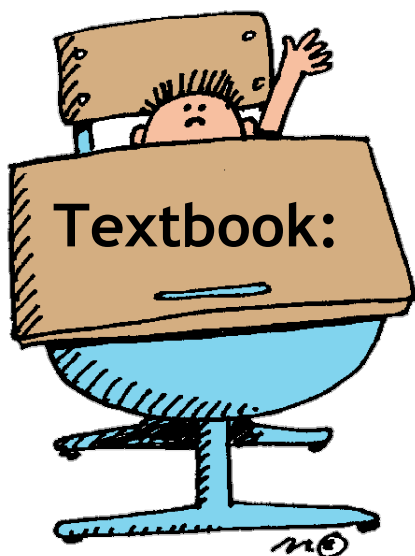
Definition of a derivative $\lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$

Graphing f from f' and vice-versa

Differentiability of functions

Easy Word Problem





Practice



Page 114-115

#5, 7, 9, 11-16

(Differentiability)

Review: Red book

p. 59 #9, 10

p. 61 #2

p. 112 #1, 3, 10, 11

p. 115 #1

Attachments

2.1_74_AP.html



2.1_74_AP.swf



2.1_74_AP.html