

May 20, 2014

The critical points of a function are  
 $x = -2, 0$  and  $3$ .

The second derivative is:

$$f''(x) = -2x + 1$$

Determine if each critical point is a minimum or maximum. Justify your answers.

$x = -2, 0$  and  $3$

$$f''(x) = -2x + 1$$

$$f''(-2) = -2(-2) + 1 = 5$$

min at  $x = -2$  because  $f''(x)$  is positive  
(so  $f(x)$  is concave up)

min at  $x = 0$  because  $f''(0)$  is positive

max at  $x = 3$  because  $f''(3)$  is negative  
(so  $f(x)$  is concave down.)

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Students will verbally explain how to determine properties of the function, its derivative and its second derivative.

(using the words:  
positive, negative, increasing, decreasing,  
concave up, concave down, etc...)

Set #20

Pg 222

#3 – 9 (odd – no calculator)

#11 – 19 (odd – calculator ok)

#30 – 58 (EOE) .....

critical points

Set #21

Pg 232 #19 – 52 (do two, skip three)

(after #31 you may use a  
calculator to solve for your  
critical points) .....

first derivative test for  
extrema

Set #22

Pg 238 #25 – 38

(skip multiples of 3) .....

second derivative test for  
extrema

Set #23

Pg 238 #1, 3 – 18

(multiples of 3), 20 – 23 .....

second derivative test for  
concavity