

11/09/11

- Turn in Quick Reviews #1 & #2
- 4.1 - 4.2 QUIZ FRIDAY

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second
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COROLLARY 1 Increasing and Decreasing Functions

Let f be continuous on $[a, b]$ and differentiable on (a, b) .

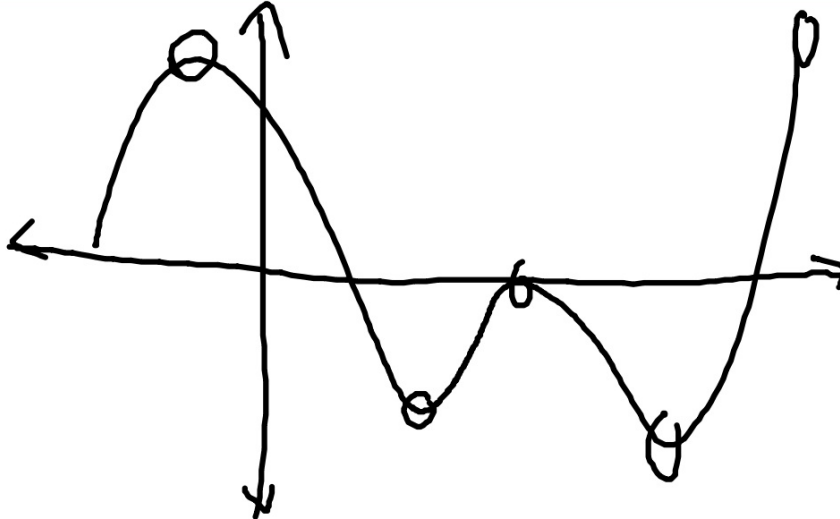
1. If $f' > 0$ at each point of (a, b) , then f increases on $[a, b]$.
2. If $f' < 0$ at each point of (a, b) , then f decreases on $[a, b]$.

first
→

DEFINITIONS Increasing Function, Decreasing Function

Let f be a function defined on an interval I and let x_1 and x_2 be any two points in I .

1. f **increases** on I if $x_1 < x_2 \Rightarrow f(x_1) < f(x_2)$.
2. f **decreases** on I if $x_1 < x_2 \Rightarrow f(x_1) > f(x_2)$.

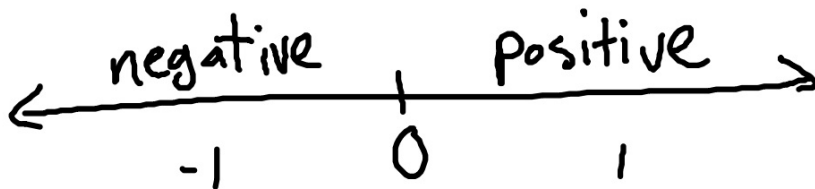


EXAMPLE 5 Determining Where Graphs Rise or Fall

The function $y = x^2$ (Figure 4.16) is

$$y' = 2x$$

(a) decreasing on $(-\infty, 0)$ b/c $f' < 0$ for all x in $(-\infty, 0)$
(b) increasing on $(0, \infty)$ b/c $f' > 0$ for all x in $(0, \infty)$



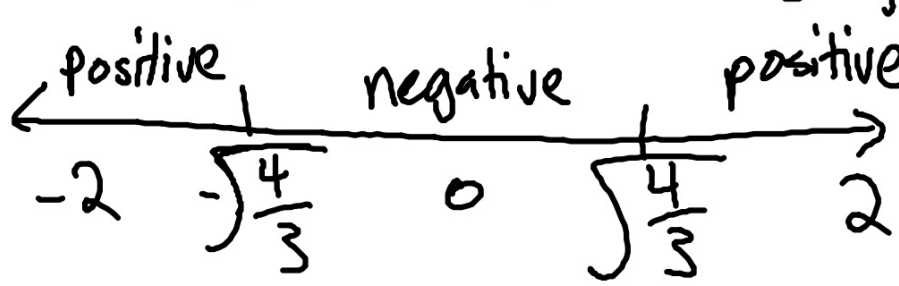
EXAMPLE 6 Determining Where Graphs Rise or Fall

Where is the function $f(x) = x^3 - 4x$ increasing and where is it decreasing?

$$f'(x) = 3x^2 - 4$$

Increasing $(-\infty, -\sqrt{\frac{4}{3}}) \cup (\sqrt{\frac{4}{3}}, \infty)$ b/c $f' > 0$ for all

Decreasing $(-\sqrt{\frac{4}{3}}, \sqrt{\frac{4}{3}})$ b/c $f' < 0$ for all x in the interval $(-\infty, -\sqrt{\frac{4}{3}}) \cup (\sqrt{\frac{4}{3}}, \infty)$



HW - p. 202 #15-27 odd, 53, 54, 56

Reminder - QUIZ FRIDAY on 4.1-4.2