

AP Calculus Analyzing a Function's 1st Derivative and 2nd Derivative with TI-84 Graphing...

Lesson 282 | Calculus AB | Extrema and derivative tests

<https://www.youtube.com/watch?v=7uSBZdi-jTY>

Original practice aligned to the saved video title.

Name: _____ Date: _____ Show your reasoning.

01 Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 192 \cdot x + 9$.

02 Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 147 \cdot x + 3$.

03 Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 147 \cdot x + 11$.

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04

Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 48 \cdot x + 6$.

05

Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 243 \cdot x + 13$.

06

Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 48 \cdot x + 8$.

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- 01** Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 192 \cdot x + 9$.
 $f'=3(x^2-64)$, zero at ± 8 . Increasing $(-\infty, -8)$ and $(8, \infty)$; decreasing $(-8, 8)$. Local maximum $(-8, 1033)$; local minimum $(8, -1015)$. $f''=6x$: concave down $x < 0$, up $x > 0$; inflection $(0, 9)$.
- 02** Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 147 \cdot x + 3$.
 $f'=3(x^2-49)$, zero at ± 7 . Increasing $(-\infty, -7)$ and $(7, \infty)$; decreasing $(-7, 7)$. Local maximum $(-7, 689)$; local minimum $(7, -683)$. $f''=6x$: concave down $x < 0$, up $x > 0$; inflection $(0, 3)$.
- 03** Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 147 \cdot x + 11$.
 $f'=3(x^2-49)$, zero at ± 7 . Increasing $(-\infty, -7)$ and $(7, \infty)$; decreasing $(-7, 7)$. Local maximum $(-7, 697)$; local minimum $(7, -675)$. $f''=6x$: concave down $x < 0$, up $x > 0$; inflection $(0, 11)$.

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04

Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 48x + 6$.

$f'=3(x^2-16)$, zero at ± 4 . Increasing $(-\infty, -4)$ and $(4, \infty)$; decreasing $(-4, 4)$. Local maximum $(-4, 134)$; local minimum $(4, -122)$. $f''=6x$: concave down $x < 0$, up $x > 0$; inflection $(0, 6)$.

05

Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 243x + 13$.

$f'=3(x^2-81)$, zero at ± 9 . Increasing $(-\infty, -9)$ and $(9, \infty)$; decreasing $(-9, 9)$. Local maximum $(-9, 1471)$; local minimum $(9, -1445)$. $f''=6x$: concave down $x < 0$, up $x > 0$; inflection $(0, 13)$.

06

Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 48x + 8$.

$f'=3(x^2-16)$, zero at ± 4 . Increasing $(-\infty, -4)$ and $(4, \infty)$; decreasing $(-4, 4)$. Local maximum $(-4, 136)$; local minimum $(4, -120)$. $f''=6x$: concave down $x < 0$, up $x > 0$; inflection $(0, 8)$.