

Calculus Section 4.3 Part II Lecture, 1st, and 2nd Derivative Test and Function Graph Ana...

Lesson 281 | Calculus AB | Extrema and derivative tests

<https://www.youtube.com/watch?v=csPPHsXKc8o>

Original practice aligned to the saved video title.

Name: _____ Date: _____ Show your reasoning.

01 Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 300 \cdot x + 5$.

02 Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 192 \cdot x + 6$.

03 Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 75 \cdot x + 13$.

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Name: _____ Date: _____ Show your reasoning.

04 Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 300 \cdot x + 9$.

05 Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 108 \cdot x + 9$.

06 Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 588 \cdot x + 2$.

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- 01** Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 300 \cdot x + 5$.
 $f'=3(x^2-100)$, zero at ± 10 . Increasing $(-\infty, -10)$ and $(10, \infty)$; decreasing $(-10, 10)$. Local maximum $(-10, 2005)$; local minimum $(10, -1995)$. $f''=6x$: concave down $x < 0$, up $x > 0$; inflection $(0, 5)$.
- 02** Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 192 \cdot x + 6$.
 $f'=3(x^2-64)$, zero at ± 8 . Increasing $(-\infty, -8)$ and $(8, \infty)$; decreasing $(-8, 8)$. Local maximum $(-8, 1030)$; local minimum $(8, -1018)$. $f''=6x$: concave down $x < 0$, up $x > 0$; inflection $(0, 6)$.
- 03** Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 75 \cdot x + 13$.
 $f'=3(x^2-25)$, zero at ± 5 . Increasing $(-\infty, -5)$ and $(5, \infty)$; decreasing $(-5, 5)$. Local maximum $(-5, 263)$; local minimum $(5, -237)$. $f''=6x$: concave down $x < 0$, up $x > 0$; inflection $(0, 13)$.

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Original practice aligned to the saved video title.

- 04** Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 300\cdot x + 9$.
 $f'=3(x^2-100)$, zero at ± 10 . Increasing $(-\infty, -10)$ and $(10, \infty)$; decreasing $(-10, 10)$. Local maximum $(-10, 2009)$; local minimum $(10, -1991)$. $f''=6x$: concave down $x < 0$, up $x > 0$; inflection $(0, 9)$.
- 05** Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 108\cdot x + 9$.
 $f'=3(x^2-36)$, zero at ± 6 . Increasing $(-\infty, -6)$ and $(6, \infty)$; decreasing $(-6, 6)$. Local maximum $(-6, 441)$; local minimum $(6, -423)$. $f''=6x$: concave down $x < 0$, up $x > 0$; inflection $(0, 9)$.
- 06** Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 588\cdot x + 2$.
 $f'=3(x^2-196)$, zero at ± 14 . Increasing $(-\infty, -14)$ and $(14, \infty)$; decreasing $(-14, 14)$. Local maximum $(-14, 5490)$; local minimum $(14, -5486)$. $f''=6x$: concave down $x < 0$, up $x > 0$; inflection $(0, 2)$.