

The Secret of Finding Relative and Absolute Maximum or Minimum in Calculus Section 4.1

Lesson 280 | Calculus AB | Extrema and derivative tests

https://www.youtube.com/watch?v=1atzW_ScXqY

Original practice aligned to the saved video title.

Name: _____ Date: _____ Show your reasoning.

01 Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 147 \cdot x + 12$.

02 Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 108 \cdot x + 7$.

03 Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 507 \cdot x + 11$.

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04

Find critical points, increasing/decreasing intervals, and concavity of $f(x) = x^3 - 363 \cdot x + 10$.

05

Find critical points, increasing/decreasing intervals, and concavity of $f(x) = x^3 - 243 \cdot x + 8$.

06

Find critical points, increasing/decreasing intervals, and concavity of $f(x) = x^3 - 363 \cdot x + 13$.

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01

Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 147 \cdot x + 12$.

$f'=3(x^2-49)$, zero at ± 7 . Increasing $(-\infty, -7)$ and $(7, \infty)$; decreasing $(-7, 7)$. Local maximum $(-7, 698)$; local minimum $(7, -674)$. $f''=6x$: concave down $x < 0$, up $x > 0$; inflection $(0, 12)$.

02

Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 108 \cdot x + 7$.

$f'=3(x^2-36)$, zero at ± 6 . Increasing $(-\infty, -6)$ and $(6, \infty)$; decreasing $(-6, 6)$. Local maximum $(-6, 439)$; local minimum $(6, -425)$. $f''=6x$: concave down $x < 0$, up $x > 0$; inflection $(0, 7)$.

03

Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 507 \cdot x + 11$.

$f'=3(x^2-169)$, zero at ± 13 . Increasing $(-\infty, -13)$ and $(13, \infty)$; decreasing $(-13, 13)$. Local maximum $(-13, 4405)$; local minimum $(13, -4383)$. $f''=6x$: concave down $x < 0$, up $x > 0$; inflection $(0, 11)$.

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04

Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 363 \cdot x + 10$.

$f'=3(x^2-121)$, zero at ± 11 . Increasing $(-\infty, -11)$ and $(11, \infty)$; decreasing $(-11, 11)$. Local maximum $(-11, 2672)$; local minimum $(11, -2652)$. $f''=6x$: concave down $x < 0$, up $x > 0$; inflection $(0, 10)$.

05

Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 243 \cdot x + 8$.

$f'=3(x^2-81)$, zero at ± 9 . Increasing $(-\infty, -9)$ and $(9, \infty)$; decreasing $(-9, 9)$. Local maximum $(-9, 1466)$; local minimum $(9, -1450)$. $f''=6x$: concave down $x < 0$, up $x > 0$; inflection $(0, 8)$.

06

Find critical points, increasing/decreasing intervals, and concavity of $f(x)=x^3 - 363 \cdot x + 13$.

$f'=3(x^2-121)$, zero at ± 11 . Increasing $(-\infty, -11)$ and $(11, \infty)$; decreasing $(-11, 11)$. Local maximum $(-11, 2675)$; local minimum $(11, -2649)$. $f''=6x$: concave down $x < 0$, up $x > 0$; inflection $(0, 13)$.