

7.4 Polynomials with a Calculator

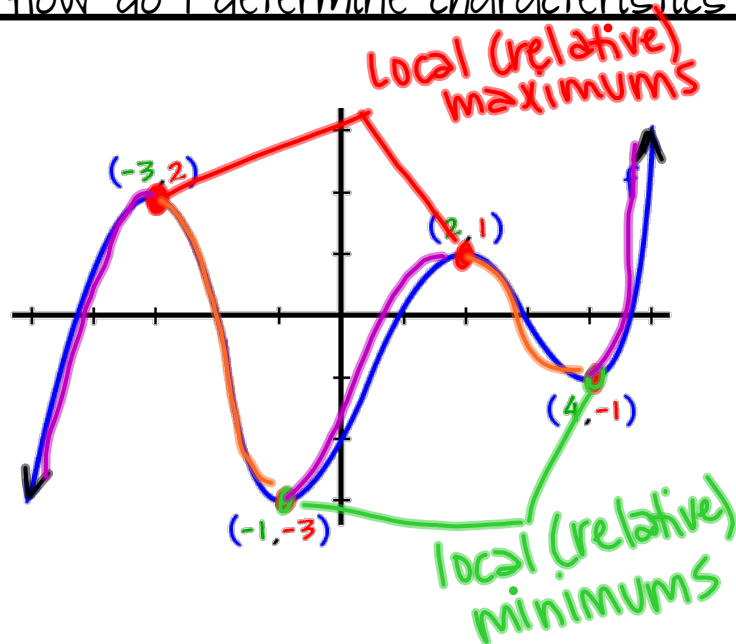
Essential Question

How do I determine characteristics of polynomial graphs using a calculator?

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Local Extrema

-highest/lowest pt in an area

Max # \rightarrow degree - 1

[ex] $3x^5 - 3x^2 + 2x$
max. of 4 high/lows

increasing: + slope
 $(-\infty, -3) \cup (-1, 2) \cup (4, \infty)$

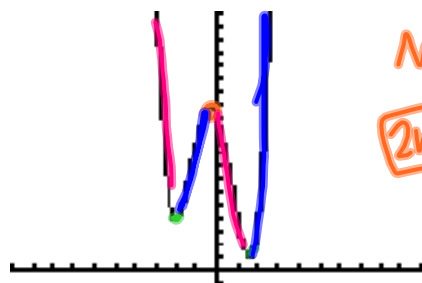
decreasing: - slope
 $(-3, -1) \cup (2, 4)$

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ex. $y = x^4 + x^3 - 6x^2 - 4x + 12$



mins / maxs
 $\boxed{2\text{nd}} \boxed{\text{TRACE}}$

in c: $(-2, -319) \cup (1.569, \infty)$
 dec: $(-\infty, -2) \cup (-.319, 1.569)$

max: $(-.319, 12.643)$
 min: $(-2, 4)$
 $(1.569, .876)$

ex. $y = -x^2 + 3x - 2$

zeros

$\boxed{(1,0)} \quad \boxed{(2,0)}$

$\boxed{2\text{nd}} \boxed{\text{TRACE}} \quad 2: \text{zero}$

$\bullet \quad y/2 = 0$

$\boxed{2\text{nd}} \boxed{\text{TRACE}} \quad 5: \text{intersect}$

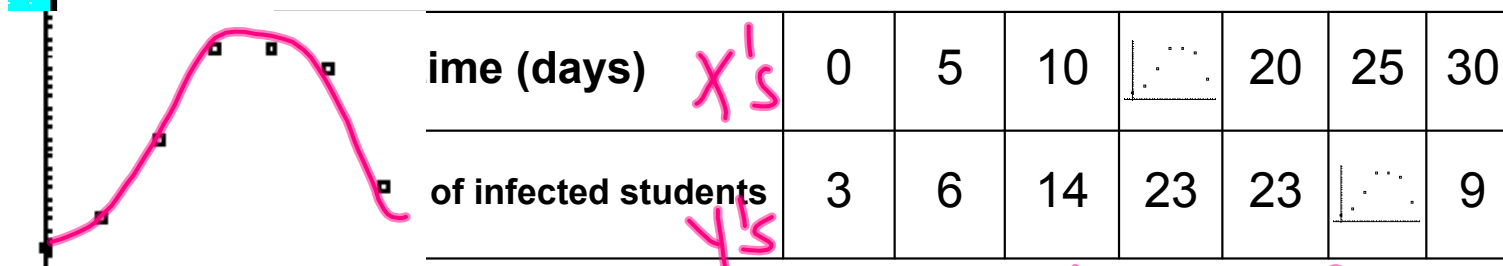
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Fitting a Model

After the winter break, 3 students came to school sick with the flu. The following table shows the number of students infected with the flu depending on the number of days after the winter break.



Find a polynomial model of the data.

Find the day at which the number of infected students will reach the maximum.

When will the number of infected students drop to zero?

$$y = .0001x^4 - .012x^3 + .26x^2 - .393x$$

+2.95

20 days

33 days