

4. Let $f(x) = 2x^4 - 7x^2 + 6x$.

a. Compute $f'(x)$.

$$f'(x) = 8x^3 - 14x + 6$$

b. Write an equation for the tangent line to the graph of $y = f(x)$ at the point with $x = -1$.

$$y - (-11) = 12 \cdot (x - (-1))$$

 Write only the equation (and nothing else) in the box!

$$f'(-1) = 12, \quad f(-1) = -11$$

c. Find the absolute maximum and minimum values of f on the interval $[-2, 2]$.

$$f'(x) = 2 \cdot (4x^3 - 7x + 3) = 2 \cdot (x-1) \cdot (4x^2 + 4x - 3) = 2 \cdot (x-1)(2x-1)(2x+3)$$

$$f'(x) = 0 \Rightarrow x = 1 \text{ or } x = \frac{1}{2} \text{ or } x = -\frac{3}{2}$$

Critical points

$$x = 1 \Rightarrow f(1) = 1$$

$$x = \frac{1}{2} \Rightarrow f\left(\frac{1}{2}\right) = \frac{11}{8}$$

$$x = -\frac{3}{2} \Rightarrow f\left(-\frac{3}{2}\right) = -\frac{117}{8}$$

Endpoints

$$x = -2 \Rightarrow f(-2) = -8$$

$$x = 2 \Rightarrow f(2) = 16$$

The absolute maximum value is 16.

The absolute minimum value is $-\frac{117}{8}$.