

5.7 The Second Derivative Test

Calculus

Name: _____

CA #1

Find the extrema by using the Second Derivative Test. Justify your answer.

1. $f(x) = xe^x$

2. $g(x) = x^{\frac{2}{3}} - 3$

3. $g(x) = 2\cos x + x$ on the interval $[0, 2\pi]$

4. $h(x) = -x^3 + 4x^2 - 5$

1. Abs min at $x = -1$ because $f'(-1) = 0$ and $f''(-1) < 0$.	3. Rel max at $x = \frac{6}{\pi}$ because $f'(\frac{6}{\pi}) = 0$ and $f''(\frac{6}{\pi}) < 0$.
2. 2 nd Derivative Test cannot be applied because there are no x values where $f'(x) = 0$.	4. Rel min at $x = 0$ because $f'(0) = 0$ and $f''(0) > 0$.
Rel min at $x = \frac{6}{5\pi}$ because $f'(\frac{6}{5\pi}) = 0$ and $f''(\frac{6}{5\pi}) < 0$.	Rel max at $x = \frac{3}{8}$ because $f'(\frac{3}{8}) = 0$ and $f''(\frac{3}{8}) > 0$.

Answers to 5.7 CA #1