

SATPREP

Assignment- Properties of curve

For each problem, find the x-coordinates of all critical points.

1) $y = \frac{x^2}{4x - 8}$

2) $y = x^2 - 6x + 11$

For each problem, find the open intervals where the function is increasing and decreasing.

3) $y = x^3 + 4x^2 + 4x - 1$

4) $y = -x^3 + 5x^2 - 7x + 1$

For each problem, find the open intervals where the function is concave up and concave down.

5) $y = -x^3 + 4x^2 - 2$

6) $y = -x^3 + 3x^2 - 6$

7) $y = \frac{x^2}{4x + 4}$

8) $y = x^3 + 5x^2 + 8x + 4$

For each problem, find all points of absolute minima and maxima on the given interval.

9) $y = -2x^2 - 8x - 6; [-3, -1]$

For each problem, find all points of relative minima and maxima.

10) $y = -\frac{x^2}{2} - 2x + 1$

Answers to Assignment-

- 1) Critical points at: $x = 0, 4$
- 2) Critical point at: $x = 3$
- 3) Increasing: $(-\infty, -2), (-\frac{2}{3}, \infty)$ Decreasing: $(-2, -\frac{2}{3})$
- 4) Increasing: $(1, \frac{7}{3})$ Decreasing: $(-\infty, 1), (\frac{7}{3}, \infty)$
- 5) Concave up: $(-\infty, \frac{4}{3})$ Concave down: $(\frac{4}{3}, \infty)$
- 6) Concave up: $(-\infty, 1)$ Concave down: $(1, \infty)$
- 7) Concave up: $(-1, \infty)$ Concave down: $(-\infty, -1)$
- 8) Concave up: $(-\frac{5}{3}, \infty)$ Concave down: $(-\infty, -\frac{5}{3})$
- 9) Absolute minima: $(-3, 0), (-1, 0)$
Absolute maximum: $(-2, 2)$
- 10) No relative minima.
Relative maximum: $(-2, 3)$

