SATPREP Name_____

Assignment : Derivative

For each problem, find the derivative of the function at the given value.

1) $y = -2x^2 - 16x - 26$ at $x = -2$

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

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

4) $y = 2x^2 + 12x + 19$ at $x = -2$

For each problem, find the points where gradient of the tangent is zero

5) $y = x^3 - 4x^2 + 6$

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

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

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

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

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

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

11) $y = -x^3 + 8x^2 - 20x + 13$

12) $y = x^3 - 3x^2 - 1$

Answers to Assignment : Derivative

1) $\left.\frac{dy}{dx}\right|_{x=-2} = -8$

2) $\left.\frac{dy}{dx}\right|_{x=2} = 0$

3) $\left.\frac{dy}{dx}\right|_{x=-3} = 2$

4) $\left.\frac{dy}{dx}\right|_{x=-2} = 4$

5) $(0, 6), \left(\frac{8}{3}, -\frac{94}{27}\right)$

6) $(0, 4), \left(\frac{4}{3}, \frac{76}{27}\right)$

7) $(0, -4), (2, 0)$

8) $(0, -1), \left(\frac{2}{3}, -\frac{23}{27}\right)$

9) Relative minimum: $\left(\frac{2}{3}, \frac{23}{27}\right)$
Relative maximum: $(0, 1)$

10) Relative minimum: $(3, 2)$
No relative maxima.

11) Relative minimum: $(2, -3)$
Relative maximum: $\left(\frac{10}{3}, -\frac{49}{27}\right)$

12) Relative minimum: $(2, -5)$
Relative maximum: $(0, -1)$