SATPREP Name_____

Assignment: Slope and equation of tangent and normal

Date_____

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

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

2) $y = -x^3 - 7x^2 - 15x - 9$ at $x = -2$

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

4) $y = (-2x + 2)^{\frac{1}{2}}$ at $x = -1$

For each problem, find the equation of the line tangent to the function at the given point. Your answer should be in slope-intercept form.

5) $y = (2x - 4)^{\frac{1}{3}}$ at $(-2, -2)$

6) $y = \frac{x^2}{2} - 4x + 2$ at $\left(1, -\frac{3}{2}\right)$

7) $y = -x^3 - 11x^2 - 40x - 44$ at $(-2, 0)$

8) $y = x^2 - 6x + 4$ at $(0, 4)$

For each problem, find the points where the tangent line to the function is horizontal.

9) $y = x^2 - 4x$

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

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

12) $y = \frac{x^2}{2} - 4x + 3$

Answers to Assignment: Slope and equation of tangent and normal

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

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

3) $\left.\frac{dy}{dx}\right|_{x=3} = 9$

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

5) $y = \frac{1}{6}x - \frac{5}{3}$

6) $y = -3x + \frac{3}{2}$

7) $y = -8x - 16$

8) $y = -6x + 4$

9) $(2, -4)$

10) $(0, 1), (2, 5)$

11) $(1, -2)$

12) $(4, -5)$