Mathematics (2YP) Name_____

Tangents & Normals

Date_____ Period____

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.

1) $f(x) = -x^2 - 4x - 5$ at $(-3, -2)$

2) $f(x) = -x^3 + x^2$ at $(-1, 2)$

3) $f(x) = x^2 - 2x - 3$ at $(2, -3)$

4) $f(x) = -x^3 + 13x^2 - 56x + 83$ at $(3, 5)$

For each problem, find the equation of the line normal to the function at the given point. If the normal line is a vertical line, indicate so. Otherwise, your answer should be in slope-intecept form.

5) $y = -x^3 + 2x^2 + 2$ at $(-1, 5)$

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

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

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

For each problem, find the points where the tangent line to the function is horizontal.(that means gradient is 0)

9) $y = \frac{x^2}{2} - 3x + \frac{11}{2}$

10) $y = -\frac{x^2}{2} + 5$

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

12) $y = \frac{x^2}{2} - x - \frac{5}{2}$

Answers to Tangents & Normals (ID: 1)

1) $y = 2x + 4$

2) $y = -5x - 3$

3) $y = 2x - 7$

4) $y = -5x + 20$

5) $y = \frac{1}{7}x + \frac{36}{7}$

6) $y = 6x - 20$

7) $y = \frac{3}{2}x - \frac{11}{2}$

8) $y = \frac{1}{5}x - \frac{9}{5}$

9) $(3, 1)$

10) $(0, 5)$

11) $\left(0, \frac{1}{2}\right)$

12) $(1, -3)$