AP Calculus AB: Due 9/28; Use separate sheet(s) Name_____

Def. of Derivative; Power Rule; Tan Lines 8)

Date_____

Use the limit definition of the derivative to find the derivative of each function. (Use the power rule to check.)

1) $y = -5x^2 + 1$

2) $y = 2x^2 - 5$

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

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

Find the derivative $\frac{dy}{dx}$ or f '(x) of each function. Simplify all answers so there are no negative or fractional exponents.

5) $f(x) = 3 + \frac{5}{x^4}$

6) $y = 3 + \frac{5}{x} + \frac{2}{x^4}$

7) $y = \frac{3}{x^5}$

8) $y = 2x^2 + 4\sqrt[3]{x^2} + \frac{4}{x^3}$

9) $y = x^4 + 2\sqrt[3]{x^2}$

10) $f(x) = 5x^2 + 3\sqrt[3]{x^2}$

11) $y = -2x^3 + \frac{5}{x^3}$

12) $f(x) = 3x^4 + \sqrt[3]{x^2} + 5\sqrt[5]{x^2}$

13) $f(x) = 3x^3 + \sqrt[3]{x} - 5$

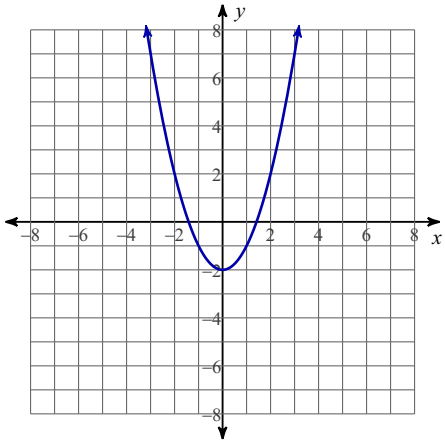
14) $y = 4x^3 - 4\sqrt[3]{x}$

15) $f(x) = 5x^5 + 4\sqrt[4]{x}$

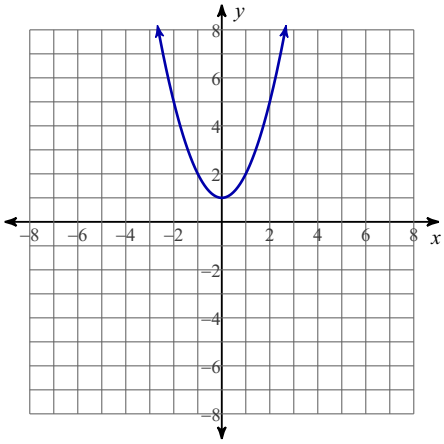
16) $y = 2x^5 - 4x^4 + 2$

For each problem, find the slope-intercept equation of the tangent line to the function at the given point. Then graph the tangent line.

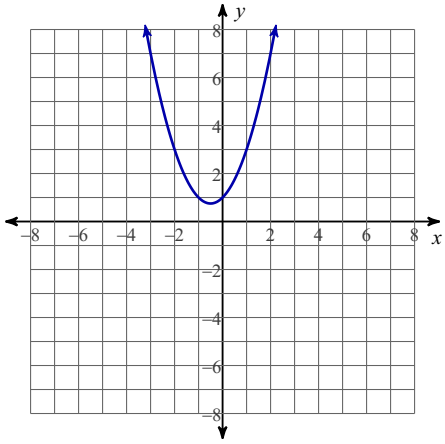
17) $y = x^2 - 2;\ (-2, 2)$



18) $y = x^2 + 1;\ (0, 1)$



19) $y = x^2 + x + 1;\ (-3, 7)$



20) $y = -x^2 + 2;\ (2, -2)$