AP Calculus - Assignment #Review 2Aa

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

1) $f(x) = x^2 - 8x + 14$ at $x = 1$

2) $f(x) = -2x^2 - 16x - 32$ at $x = -3$

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

3) $y = -\dfrac{6}{x^2 + 3}$ at $x = -3$

4) $y = \tan(x)$ at $x = -\dfrac{\pi}{3}$

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

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

6) $y = -\dfrac{25x}{x^2 + 25}$

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.

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

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

Use the definition of the derivative to find the derivative of each function with respect to x.

9) $y = \sqrt{4x + 5}$

10) $y = x^2 + 1$

11) $y = -\dfrac{2}{x + 3}$

12) $y = \sqrt{2x + 5}$

For each problem, find the average rate of change of the function over the given interval and also find the instantaneous rate of change at the leftmost value of the given interval.

13) $f(x) = x^2 + 1$; $[1, \frac{3}{2}]$

14) $f(x) = \dfrac{1}{x - 1}$; $[-5, -\frac{9}{2}]$

15) $f(x) = \dfrac{1}{x+3}$; $[-2, -\dfrac{3}{2}]$

16) $f(x) = \dfrac{1}{x-3}$; $[-3, -\dfrac{5}{2}]$

Differentiate each function with respect to x.

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

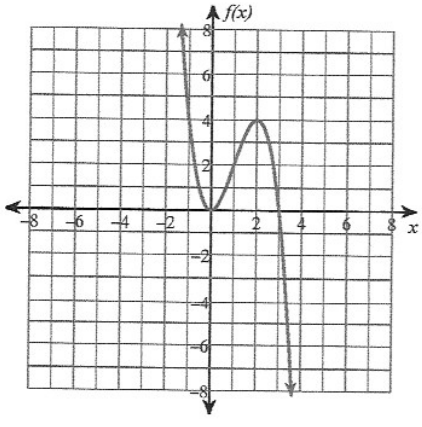
18) $y = (-3x^5 - 3)(4x^2 - 3)$

19) $y = \dfrac{4x^3}{5x^2 - 3}$

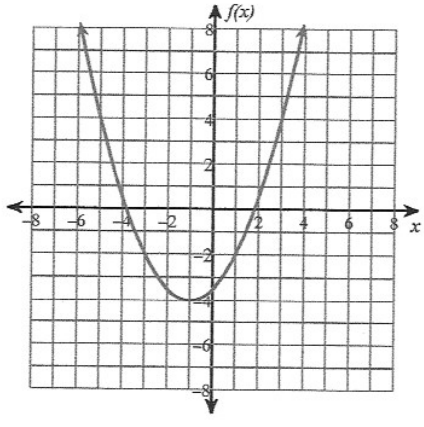
20) $y = \dfrac{3}{x^3 + 2}$

Given the graph of $f(x)$, sketch an approximate graph of $f'(x)$.

21)



22)



23)