Good afternoon: warm up

Write the point-slope equation of the line tangent to y=2sin(x) when x=π/6

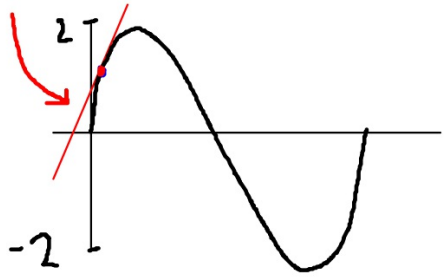
$y - y_1 = m(x - x_1)$

$f\left(\frac{\pi}{6}\right)$ $f'\left(\frac{\pi}{6}\right)$

- $f\left(\frac{\pi}{6}\right) = 2\sin\left(\frac{\pi}{6}\right) = 2 \cdot \frac{1}{2} = 1$
- $f'(x) = 2\cos(x)$

$f'\left(\frac{\pi}{6}\right) = 2\cos\left(\frac{\pi}{6}\right) = 2 \cdot \frac{\sqrt{3}}{2} = \sqrt{3}$

$y - 1 = \sqrt{3}\left(x - \frac{\pi}{6}\right)$



HW

1. -10x
2. 4x do it the long way
3. 6x-3
4. -8x+1

see next page for
the non fractional exponent answers

5) $f'(x) = -\frac{20}{x^5}$

6) $\frac{dy}{dx} = -\frac{5}{x^2} - \frac{8}{x^5}$

7) $\frac{dy}{dx} = -\frac{15}{x^6}$

8) $\frac{dy}{dx} = 4x + \frac{8}{3x^{\frac{1}{3}}} - \frac{12}{x^4}$

9) $\frac{dy}{dx} = 4x^3 + \frac{4}{3x^{\frac{1}{3}}}$

10) $f'(x) = 10x + \frac{2}{x^{\frac{1}{3}}}$

11) $\frac{dy}{dx} = -6x^2 - \frac{15}{x^4}$

12) $f'(x) = 12x^3 + \frac{2}{3x^{\frac{1}{3}}} + \frac{2}{x^{\frac{3}{5}}}$

13) $f'(x) = 9x^2 + \frac{1}{3x^{\frac{2}{3}}}$

14) $\frac{dy}{dx} = 12x^2 - \frac{4}{3x^{\frac{2}{3}}}$

15) $f'(x) = 25x^4 + \frac{1}{x^{\frac{3}{4}}}$

16) $\frac{dy}{dx} = 10x^4 - 16x^3$

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

1) $\frac{dy}{dx} = -10x$

2) $\frac{dy}{dx} = 4x$

3) $\frac{dy}{dx} = 6x - 3$

4) $\frac{dy}{dx} = -8x + 1$

5) $f'(x) = -\frac{20}{x^5}$

6) $\frac{dy}{dx} = -\frac{5}{x^2} - \frac{8}{x^5}$

7) $\frac{dy}{dx} = -\frac{15}{x^6}$

8) $\frac{dy}{dx} = 4x + \frac{8}{3x^{\frac{1}{3}}} - \frac{12}{x^4}$

9) $\frac{dy}{dx} = 4x^3 + \frac{4}{3x^{\frac{1}{3}}}$

10) $f'(x) = 10x + \frac{2}{x^{\frac{1}{3}}}$

11) $\frac{dy}{dx} = -6x^2 - \frac{15}{x^4}$

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13) $f'(x) = 9x^2 + \frac{1}{3x^{\frac{2}{3}}}$

14) $\frac{dy}{dx} = 12x^2 - \frac{4}{3x^{\frac{2}{3}}}$

15) $f'(x) = 25x^4 + \frac{1}{x^{\frac{3}{4}}}$

16) $\frac{dy}{dx} = 10x^4 - 16x^3$

17) $y = -4x - 6$

18) $y = 1$

19) $y = -5x - 8$

20) $y = -4x + 6$

8.) $\frac{dy}{dx} = 4x + \frac{8}{3\sqrt[3]{x}} - \frac{12}{x^4}$

9.) $\frac{dy}{dx} = 4x^3 + \frac{4}{3\sqrt[3]{x}}$

10.) $f'(x) = 10x + \frac{2}{\sqrt[3]{x}}$

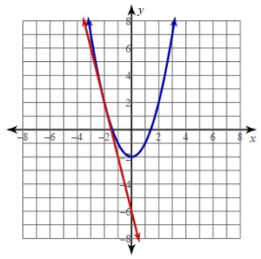
12.) $f'(x) = 12x^3 + \frac{2}{3\sqrt[3]{x}} + \frac{2}{\sqrt[5]{x^3}}$

13.) $f'(x) = 9x^2 + \frac{1}{3\sqrt[3]{x^2}}$

14.) $\frac{dy}{dx} = 12x^2 - \frac{4}{3\sqrt[3]{x^2}}$

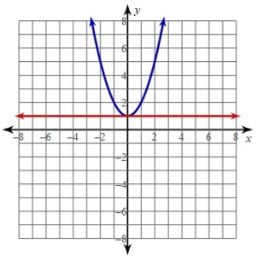
15.) $f'(x) = 25x^4 + \frac{1}{\sqrt[4]{x^3}}$

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



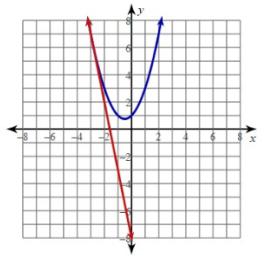
$y = -4x - 6$

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



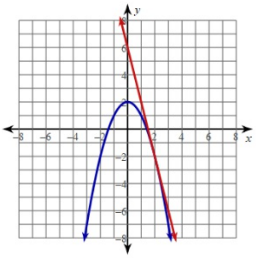
$y = 1$

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



$y = -5x - 8$

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



$y = -4x + 6$

Additional Practice if desired

F-C4 IVT
p92 #63 (find the zero, also)

D-C1 Limit Def. of Derivative
just make up any quadratic equation and use the limit definition to find dy/dx (use the power rule to check)

F-C3 Discontinuities
p. 82 #51-54
(find, classify, justify)

D-C7 Power Rule
p. 157 #9-17

F-L1a Basic Limits
p91 #11-20

F-L2a Graph Limits
p 56 #23-24

F-B1 Asymptotes
p92 #67-71
(find va and ha)