Calculus AB CH.2 Review WS 2.1-2. 5   Name_____Per._____

Find each derivative

1) $f(x) = \tan(3x)$

2) $f(x) = \sec(x^2)$

3) $f(x) = \cos(7x^3)$

4) $f(x) = \cot(5x^2)$

5) $f(x) = \csc(11x)$

6) $f(x) = \sin(333x)$

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7) $f(x) = 3x^2 - 7x + 8$

a) $f'(x) =$

c) Equation of the tangent line at $x = 2$

b) $f'(2) =$

d) Equation of the normal line at $x = 2$

Use picture at right for #8
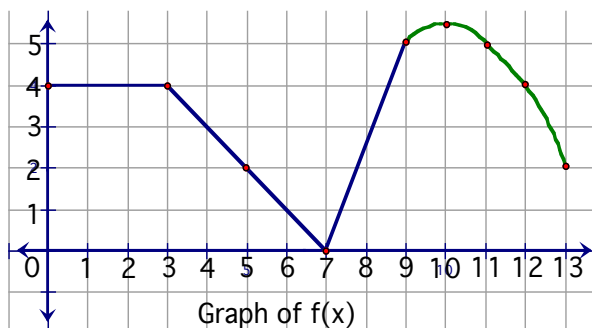
8 a) $f'(2) =$ b) $f'(3) =$ c) $f'(5) =$

d) $f'(8) =$ e) $f'(9) =$ f) $f'(10) =$

g) $f'(12) \doteq$ h)   Equation of tangent line at 12

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Graph of f(x)

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9) $\lim\limits_{h \to 0} \dfrac{\tan(x+h) - \tan x}{h} =$

10) $\lim\limits_{h \to 0} \dfrac{3(x+h)^7 - 3x^7}{h} =$

11) $\lim\limits_{h \to 0} \dfrac{(1+h)^7 - 1}{h} =$

12) $\lim\limits_{h \to 0} \dfrac{\cos\left(\dfrac{\pi}{6} + h\right) - \dfrac{\sqrt{3}}{2}}{h} =$

Find equation of the tangent line and normal line to the given equation at the given point.

13) $2xy^2 + x = 12$; $(4, -1)$

tangent line

normal line

14) Given: $x^2 - 6x + y^2 + 4y - 12 = 0$ and $\dfrac{dy}{dx} = \dfrac{-2x + 6}{2y + 4}$

a) Find the horizontal tangent(s).

b) Find the vertical tangent(s).

15) Find $\dfrac{dy}{dx}$ and $\dfrac{d^2y}{dx^2}$. $x^2 - 9y^2 = 7$

$$f(3) = 3 \qquad f'(3) = 7 \qquad f(9) = -2 \qquad f'(9) = 3$$
$$g(3) = -1 \qquad g'(3) = 4 \qquad g(9) = 0 \qquad g'(9) = 6$$

16)   Use information above to find $h'(x)$ and $h'(3)$.

a) $h(x) = f(x) \cdot g(x)$

b) $h(x) = g(f(x))$

c) $h(x) = (f(3x))^3$

Find derivatives for each.

17) $f(x) = \dfrac{2}{x} + x^{7/9} - x^{-6}$

18) $f(x) = (\sin(5x))^4$

19) $f(x) = \tan(\cos(x^2))$

20) $f(x) = 3x^3(5x^2 + 7)^5$

21) $f(x) = x^2\sqrt{x^2 - 9}$

22) $f(x) = \dfrac{x^2 + 5}{x^3 - 9}$

23) $f(x) = \dfrac{2x}{\sqrt{x - 10}}$