Calculus CH.2 Test Review

Name_____ Per.____

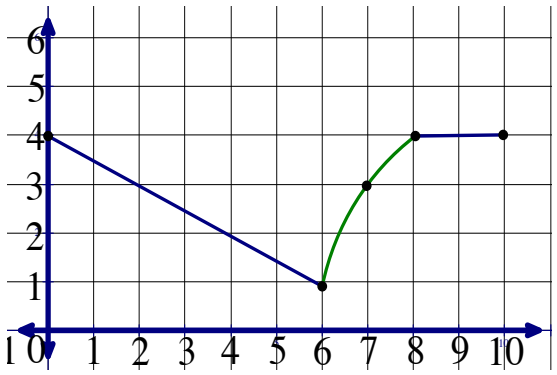
Find each derivative

1) $f(x)=\tan\left(8x^4\right)$ 2) $f(x)=\sec(5x)$ 3) $f(x)=\cos(11x+2)$ 4) $f(x)=\sin\left(x^2\right)$

Use picture at right for #5

5*a*) $f'(2)=$ *b*) $f'(6)=$ *c*) $f'(7)=$

d) $f'(9)=$ *e*) Equation of tangent line at 7



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x	0	6	12	18	24	30	36	42
f(x)	58	67	65	78	78	83	72	68

Use chart above to find each #6 - 7 (Show work)

6) $f'(21)\doteq$ 7) $f'(6)\doteq$

Evaluate

8) $\lim_{h\to 0}\dfrac{\sec(x+h)-\sec x}{h}=$ 9) $\lim_{h\to 0}\dfrac{2(2+h)^5-64}{h}=$

10) Find $\dfrac{dy}{dx}$ and $\dfrac{d^2y}{dx^2}$. $3x^2-4y^2=11$

Calculus CH.2 Review **ANSWERS**

Find each derivative

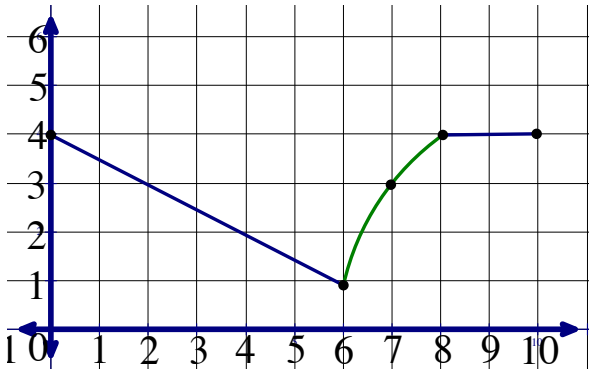
1) $f(x)=\tan\left(8x^4\right)$ $\boxed{f'(x)=\sec^2\left(8x^4\right)\cdot 32x^3}$

2) $f(x)=\sec(5x)$ $\boxed{f'(x)=\sec(5x)\tan(5x)\cdot 5}$

3) $f(x)=\cos(11x+2)$ $\boxed{f'(x)=-\sin(11x+2)\cdot 11}$

4) $f(x)=\sin\left(x^2\right)$ $\boxed{f'(x)=\cos\left(x^2\right)\cdot 2x}$

Use picture at right for #5



5*a*) $f'(2)=\boxed{\frac{-1}{2}}$ *b*) $f'(6)=\boxed{DNE}$ *c*) $f'(7)=\boxed{\frac{3}{2}}$

d) $f'(9)=\boxed{0}$ *e*) Equation of tangent line at 7

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

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x	0	6	12	18	24	30	36	42
f(x)	58	67	65	78	78	83	72	68

Use chart above to find each #6 - 7 (Show work)

6) $f'(21)\doteq\boxed{\frac{78-78}{24-18}=0}$

7) $f'(6)\doteq\boxed{\frac{65-58}{12-0}=\frac{7}{12}}$

Evaluate

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

9) $\lim\limits_{h\to 0}\dfrac{2(2+h)^5-64}{h}=\boxed{160}$

$f(x)=2x^5 \quad f'(x)=10x^4 \quad f'(2)=10(2)^4$

10) Find $\dfrac{dy}{dx}$ and $\dfrac{d^2y}{dx^2}$. $3x^2-4y^2=11$

$6x-8y\dfrac{dy}{dx}=0$ $\quad \dfrac{d^2y}{dx^2}=\dfrac{3(4y)-4\dfrac{dy}{dx}(3x)}{16y^2} \Rightarrow \dfrac{d^2y}{dx^2}=\dfrac{3(4y)-4\left(\dfrac{3x}{4y}\right)(3x)}{16y^2} \Rightarrow \dfrac{d^2y}{dx^2}=\dfrac{12y-\dfrac{9x^2}{y}}{16y^2}$

$\boxed{\dfrac{dy}{dx}=\dfrac{-6x}{-8y}=\dfrac{3x}{4y}}$ $\quad \boxed{\dfrac{d^2y}{dx^2}=\dfrac{12y^2-9x^2}{16y^3}}$ OR $\boxed{\dfrac{d^2y}{dx^2}=\dfrac{-33}{16y^3}}$