AP Calculus AB **Trig Quiz #2 Morning Review** **Name:**_____

1) If $y = \sqrt{csc^3(7 - \pi x)}$, find $\frac{dy}{dx}$

2) Given $y = \frac{\cos(x^5)}{\csc(ex)}$ Find y'

3) Given $y = -\csc(4 - \pi x)$ Find y'

4) $xcosy = tany - 3x$ find $\frac{dy}{dx}$

5) If velocity of a particle is v(t) = $2tan^3x$

a) Find a(t)

b) find acceleration at t = $\pi/4$

6. Find the tangent line equation for $f(x) = 2sec^2(2x)$ $at\ x = \frac{\pi}{6}$

Quiz Review Trig Quiz #2 Morning Session

1) $y = \sqrt{\csc^3(7-\pi x)}$ Find y'

$y = [\csc^3(7-\pi x)]^{1/2} = [\csc(7-\pi x)]^{3/2}$

$y' = \frac{3}{2}[\csc(7-\pi x)]^{1/2} \cdot -\csc(7-\pi x)\cot(7-\pi x) \cdot -\pi$

$= \boxed{\frac{3\pi}{2}[\csc(7-\pi x)]^{3/2}\cot(7-\pi x)}$

2) $y = \frac{\cos(x^5)}{\csc(ex)} = \cos(x^5)\sin(ex)$ Find y'

$y' = \underbrace{(-\sin(x^5)\cdot 5x^4)}\underbrace{(\sin(ex))} + \underbrace{\cos(x^5)}\cdot\underbrace{\cos(ex)\cdot e}$

$= \boxed{-5x^4\sin(x^5)\sin(ex) + e\cos(x^5)\cos(ex)}$

3) $y = -\csc(4-\pi x)$ Find y' and y''

$y' = -(-\csc(4-\pi x)\cot(4-\pi x))\cdot(-\pi) = \boxed{-\pi\csc(4-\pi x)\cot(4-\pi x)}$

$y'' = \underbrace{-\pi \cdot -\csc(4-\pi x)\cot(4-\pi x)\cdot(-\pi)}_{f'} \cdot \underbrace{\cot(4-\pi x)}_{g} + \underbrace{-\pi\csc(4-\pi x)}_{f} \cdot \underbrace{-\csc^2(4-\pi x)\cdot -\pi}_{g'}$

$= \boxed{-\pi^2\csc(4-\pi x)\cot^2(4-\pi x) - \pi^2\csc^3(4-\pi x)}$

4) $x\cos y = \tan y - 3x$ Find $\frac{dy}{dx}$

$(1)(\cos y) + (x)(-\sin y)\left(\frac{dy}{dx}\right) = \sec^2 y \left(\frac{dy}{dx}\right) - 3$

$\frac{dy}{dx}(-x\sin y) - \frac{dy}{dx}(\sec^2 y) = -3 - \cos y$

$\frac{dy}{dx}(-x\sin y - \sec^2 y) = -3 - \cos y$

$$\frac{dy}{dx} = \frac{-3-\cos y}{-x\sin y - \sec^2 y} = \frac{-(3+\cos y)}{-(x\sin y + \sec^2 y)} = \boxed{\frac{3+\cos y}{x\sin y + \sec^2 y}}$$

5) $y = 2\tan^3 x$ Evaluate $y'(\pi/4)$

$y = 2[\tan x]^3$

$y' = 2\cdot 3[\tan x]^2 \sec^2 x = 6\tan^2 x \sec^2 x$

$y'(\pi/4) = 6[\tan(\pi/4)]^2[\sec(\pi/4)]^2$

$= 6(1)^2(\sqrt{2})^2$

$= 6(1)(2)$ $\boxed{y'(\pi/4) = 12}$

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6) Find tangent line equation at $x = \pi/6$ for $f(x) = 2\sec^2(2x)$

$f(x) = 2[\sec(2x)]^2$ $f'(x) = 2\cdot 2[\sec(2x)]^1 \sec(2x)\tan(2x)\cdot 2 = \underline{8\sec^2(2x)\tan(2x)}$

$f'(\frac{\pi}{6}) = 8[\sec(\frac{2\pi}{6})]^2 \tan(\frac{2\pi}{6}) = 8(2)^2(\sqrt{3}) = \underline{32\sqrt{3}}$ point: $f(\pi/6) = 2[\sec(\frac{2\pi}{6})]^2 = \underline{8}$

point: $(\pi/6, 8)$
slope: $m = 32\sqrt{3}$

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

$\boxed{y - 8 = 32\sqrt{3}(x - \pi/6)}$

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$= 6(1)(2)$ $\boxed{y'(\pi/4) = 12}$

6) Find tangent line equation at $x = \pi/6$ for $f(x) = 2\sec^2(2x)$

$f(x) = 2[\sec(2x)]^2$ $f'(x) = 2\cdot 2[\sec(2x)]^1\sec(2x)\tan(2x)\cdot 2 = \underline{8\sec^2(2x)\tan(2x)}$

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