$g(x) = \frac{e^x}{x+2} \quad (0, \frac{1}{2})$

$g'(0) = \frac{(x+2)(e^x) - e^x(1)}{(x+2)^2}$

$= \frac{(0+2)(e^0) - e^0}{(0+2)^2}$

$= \frac{2-1}{4} \to 1/4$

$(y - \frac{1}{2}) = 1/4(x-0)$

Nov 1-9:47 AM

① $y = 4\sin x$

$y' = 4\cos x$

② $y = \sin(4x)$

$y' = \cos(4x)(4)$

$= 4\cos(4x)$

③ $y = \sin^2 x$

$y = \sin x \cdot \sin x$

$y = (\sin x)^2$

$y' = 2\sin x \cos x$

④ $y = \sin^2(4x)$

$y = (\sin(4x))^2$

$y' = 2(\sin(4x)) \cdot \cos(4x) \cdot 4$

$y' = 8\sin(4x)\cos(4x)$

Nov 1-9:50 AM

⑤ $y = \sin\sqrt{x}$

$y = \sin(x^{\frac{1}{2}})$

$y' = \cos(x^{\frac{1}{2}}) \cdot \frac{1}{2}x^{-\frac{1}{2}}$

$y' = \frac{\cos\sqrt{x}}{2\sqrt{x}}$

⑥ $y = \sqrt{\sin(x)}$

$y = (\sin(x))^{\frac{1}{2}}$

$y' = \frac{1}{2}(\sin(x))^{-\frac{1}{2}} \cdot \cos(x)$

$= \frac{\cos x}{2\sqrt{\sin x}}$

⑦ $y = \sqrt{\sin(4x)}$

$y = (\sin(4x))^{\frac{1}{2}}$

$y' = \frac{1}{2}(\sin(4x))^{-\frac{1}{2}} \cdot \cos(4x) \cdot 4$

$= \frac{2\cos(4x)}{\sqrt{\sin(4x)}}$

⑧ $y = \sin x \cdot \cos x$

$y' = \sin x(-\sin x) + \cos x \cdot \cos x$

$y' = -\sin^2 x + \cos^2 x$

Nov 1-9:52 AM

$y = \sqrt{\sin x + 3}$

$y = (\sin x + 3)^{\frac{1}{2}}$

$y' = \frac{1}{2}(\sin x + 3)^{-\frac{1}{2}}(\cos x)$

$y' = \frac{\cos x}{2\sqrt{\sin x + 3}}$

Nov 1-10:02 AM

$y = \tan(3x)$

$y' = \sec^2(3x) \cdot 3$

$y' = 3\sec^2(3x)$

Nov 1-10:03 AM

$y = \tan\sqrt{2x-3}$

$y = \tan((2x-3)^{\frac{1}{2}})$

$y' = \sec^2\sqrt{2x-3} \cdot \frac{1}{2}(2x-3)^{-\frac{1}{2}} \cdot 2$

$y' = \frac{\sec^2\sqrt{2x-3}}{\sqrt{2x-3}}$

Nov 1-10:04 AM