HW 11: Section 2.6

Due: Thursday, October 17th in SQRC by 9pm

Learning Goals:

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1. Find the derivatives of the functions
   (a) $f(x) = \cos(\sqrt{x})$
   (b) $f(x) = \sqrt{\cos(x)}$
   (c) $f(x) = \cos(x/2)$
2. Find the derivative of $f(t) = t^2 + 2\cos^2(4t)$.
3. Find the derivative of $f(t) = w^2 \sec^2(3w)$.
4. Find the derivative of $f(x) = 4\sin^2(3x) + 4\cos^2(3x)$.
5. Find the equation of the tangent line to the $y = \tan(3x)$ at $a = 0$.
6. A spring hanging from the ceiling vibrates up and down. Its vertical position at time t is given by $f(t) = 4\sin(3t)$. Find the velocity of the spring at time t. What is the springs maximum speed? What is it's location when it reaches its maximum speed?
7. For $f(x) = \cos(3x)$ find $f^{(75)}(x)$ (this notation means the 75th derivative.)
8. If we use degrees instead of radians to measure the angle θ, what is $\frac{d}{d\theta}\sin(\theta)$ at $\theta = 0$?