Calculator Problems

23. Evaluate with your calculator $y'(7.6)$, given $y = 3x^2 \ln x$.

115.284

24. Use your calculator to find $f'\left(\frac{\pi}{5}\right)$, given $f(t) = 5\tan(x) + \sin^3(x^2)$.

8.154

25. Find the equation of the tangent line to the graph of $y = \cos^2(4x)$ at $x = \frac{\pi}{10}$.

$y - .095 = -2.351\left(x - \frac{\pi}{10}\right)$

26. Given $s(t) = t^2 \sin t$, $t \geq 0$, where $s(t)$ is the position of a particle in meters after t seconds of motion.

a) Find the velocity function $v(t)$. $v(t) = t^2\cos t + 2t\sin t$

b) Find the acceleration function $a(t)$. $a(t) = -t^2\sin t + 2\sin t + 4t\cos t$

c) Evaluate $v(4)$ and $a(4)$ -16.513 $.137$

Evaluate $v(6)$ and $a(6)$ 31.213 32.544

d) What do your answers in part (c) tell you about the speed of the particle at those times

at $t=4$ the particle is slowing down

at $t=6$ the particle is speeding up

27. Given the position function $s(t) = -16t^2 + 14t + 525$. Time is in seconds and distance is in feet.

a) Find the average velocity from 3 seconds to 4 seconds.

$\frac{s(4) - s(3)}{4-3}$ -98 ft/sec

b) Find the velocity at 4 seconds.

-114 ft/sec

c) Find the velocity when the object strikes the ground.

$t = 6.1824$ -183.837 ft/sec