In your solution to #22 of Sec 10.2, you will have various values of t to consider.

For each value of t, you must provide the following information and write the following sentence:

(of course, instead of t_0, x_0 and y_0, you will write the correct values of t, x and y.)

At $t = t_0$, $x = x_0$, $y = y_0$, point $= (x_0, y_0)$, $\frac{dx}{dt} = \_\_\_$, $\frac{dy}{dt} = \_\_\_$.   at the point (x_0, y_0), the tangent line to the curve is __________ (horizontal or vertical).

As an example to follow, on the next page is the solution to a model problem presented using the correct format.

THE MODEL PROBLEM FOR Exercise #22 of 10.2

$x = 10 - t^2$ and $y = t^3 - 12t$

$\frac{dx}{dt} = -2t$ and $\frac{dy}{dt} = 3t^2 - 12$

The Slope of the tangent $= \frac{dy}{dx} = \frac{dy/dt}{dx/dt} = \frac{3t^2-12}{-2t}$

For Horizontal Tangents, $dy/dt = 0$ and $dx/dt \neq 0$.

Solve $dy/dt = 0 \Rightarrow 3t^2 - 12 = 0 \Rightarrow 3t^2 = 12$

$\Rightarrow t^2 = 4 \Rightarrow |t| = \sqrt{t^2} = \sqrt{4} = 2$

$\Rightarrow |t| = 2 \Rightarrow t = \pm 2$

at $t = 2$, $x = 6$, $y = -16$, point $= (6, -16)$

$\frac{dx}{dt} = -4$, $\frac{dy}{dt} = 0$

At the point $(6, -16)$, The tangent line to the curve is horizontal.

at $t = -2$, $x = 6$, $y = 16$, point $= (6, 16)$,

$dx/dt = 4$, $dy/dt = 0$.

At The point $(6, 16)$, the tangent line to the curve is horizontal.

For Vertical Tangents, $\frac{dx}{dt} = 0$ and $dy/dt \neq 0$.

Solve $\frac{dx}{dt} = 0 \Rightarrow -2t = 0 \Rightarrow t = 0$.

At $t = 0$, $x = 10$, $y = 0$, Point $= (10, 0)$, $\frac{dx}{dt} = 0$, $\frac{dy}{dt} = -12$

At The point $(10, 0)$, the tangent line to the curve is vertical.