Hints for 3.9 Either on Webassign written or both.

When it says show that the tangent line of $f(x)$ near $x=$ number. This means just find the equation of the tangent line, and see that it looks like the equation given.

Delta $T$ or $\Delta T$ and $\Delta L$ this is telling you to take the derivative of $T$ with respect $L$.
Then See how you can write your derivative to look like the one given.
For part b) Use the derivative given and rewrite the derivative $\Delta T / T=() \Delta L / L$ the percentage change in $L$ is $\Delta L / L$ do the math to find the percentage change in the period which is $\Delta T / T$.

Notation
$f(a+\Delta x)$ this is function value at $x=a+\Delta x$
$f(a)+f^{\prime}(a) \Delta x$ this is a value on the tangent line for $x=a$ at $x=a+\Delta x$
Overestimation and underestimation of values on the tangent line depends on the concavity of the function.

For question 14 , remember that the square root of $x$ is $x^{\wedge}(1 / 2)$ so $k=1 / 2$ Use the local linearization with $k=1 / 2$ so find values 1.1 and 1.05 . do you think that it is a good approximation. Find the actual value and verify your work.
Part c) state mathematically why you know it is above or below the actual value. Not just because you found the actual value.

## Question 13

Find the equation of the tangent line. Use exact values, do not use a decimal approximation. Part c) since the interval is between 0 and pi/2 the greatest possible error on the tangent line would be at one of these endpoints.
Error = Actual value - Approx. Value (value on the tangent line)
So calculate at each end point error and state which one has the largest error. This would be the greatest error that would occur using the tangent line approximation versus the actual value. Hopefully you can also see on the graph why this result is true.

