

- (c) Approximating $\sqrt{10}$. Keep some space on the right-hand side of the sheet.

2. Approximate $\frac{1}{4.9}$ using an approximate linearization.
Use the steps you have identified in the previous part.

3. (a) In the pre-class activity, you looked the tangent lines to \sqrt{x} at both $x = 1$ and $x = 9$. What difference have you noticed?
- (b) Let us approximate $\sqrt{2}$ by using the linearization (i.e. the tangent line). What do you get?
- (c) Using a calculator, compute the error of this approximation (i.e. the difference between this approximation and what you get with your calculator). Also compute the error of the approximation of $\sqrt{10}$ we did before.
- (d) What do you notice? How can we explain this difference? What factors explain this difference?

4. We want to compute an approximation of $e^{0.1}$ and $e (= e^1)$ using the tangent line.
- (a) Compute the appropriate linear approximation(s) $L(x)$. What is the function? Around what point(s) can we do that?
- (b) Using this approximation for $e^{0.1}$ and e , are we underestimating or overestimating the actual values of $e^{0.1}$ and e ?
- (c) If we compare the approximations for $e^{0.1}$ and e , which one is closer to the actual values of $e^{0.1}$ and e ? What are your arguments to support your answer?