

7. (4+3+3 points) **(a)** Determine the tangent line approximation for $f(x) = \sin x$ near $x = \frac{\pi}{3}$ (i.e., 60°).

(b) Use your answer from part (a) to give an approximation of $\sin\left(\frac{31}{90}\pi\right)$ without using your calculator. Note that $\frac{31}{90}\pi = 62^\circ$. Show your work.

(c) Should your answer for part (b) be an over estimate or an under estimate? Justify your answer without indicating what $\sin\left(\frac{31}{90}\pi\right)$ is from your calculator.