1. A light is on top of a 24 ft tall pole and a 6 ft tall person is walking away from the pole at a rate of 5 ft/sec.
   a. At what rate is the tip of the shadow moving away from the pole when the person is 25 ft away from the pole?

2. Write the general linear approximation formula.

3. Determine the linear approximation for \( f(x) = \sqrt[3]{x} \) at \( x = 8 \). Use linear approximation to approximate the value of \( \sqrt[3]{8.05} \) and \( \sqrt[3]{25} \). Which one is a better approximation and why?

4. Determine the linear approximation for \( f(x) = \tan(\theta) \) at \( \theta = 0 \).

5. Find the linear approximation to \( f(x) = \sqrt[4]{x} \) at \( x = 2 \). Use linear approximation to approximate the value of \( \sqrt[4]{3} \) and \( \sqrt[4]{10} \). Compare the approximated and exact values.

6. Find the linear approximation to \( f(x) = \cos(\frac{\theta}{2}) \) at \( \theta = 2 \). Use linear approximation to approximate the value of \( \cos(1) \) and \( \cos(9) \). Compare the approximated and exact values.