1. A young child is flying a kite with a 100 ft string. You stand beside the child and calculate the angle of elevation to be 52°. How high is the kite above the ground? (2 marks)

\[
\sin 52° = \frac{\text{opp}}{100}
\]

\[
\text{opp} = 78.80 \text{ ft}
\]

2. A homeowner wants to build a ramp up to her front door. The door is 24 inches off of the ground. If the ramp is 96 inches long, what is the angle of elevation of the ramp? Sketch and solve. (1 mark for sketch, 2 marks to solve)

\[
\theta = \sin^{-1}\left(\frac{24}{96}\right)
\]

\[
= 14.48°
\]
3. A ship has a 200 meter chain on its anchor. If the angle of depression of the chain is measured to be 50°, how deep is the water below the ship? (2 marks)

\[
\sin 50^\circ = \frac{x}{200}
\]

\[
x = 153.21 \text{ m}
\]

4. An observer in a fire tower notices a park ranger waving at an angle of depression of 40°. What distance is the ranger from the base of the tower? (2 marks)

\[
\tan 40^\circ = \frac{45}{x}
\]

\[
x = 53.63 \text{ ft}
\]