Angles of Elevation and Depression
a. The angle of elevation is the angle formed by a $\qquad$ horizontal and the line of sight
 .

b. The angle of depression is the angle formed by a $\qquad$ Horizontal and the line of sight looking down .

c. Notice ... the angle of elevation and the angle of depression are Congruent when in the same picture!

Horizontal Line
Angle of Depression
alternate interior angles!

Horizontal Line

1. Ni flies a kite on a $40-\mathrm{ft}$ string. The string has a $50^{\circ}$ angle of elevation. How high above the ground is the kite?

$$
40 \cdot \sin 50^{\circ}=\frac{x}{40} \cdot 40
$$



$$
30.6=x
$$

The kite is 30.6 feet above the ground.
2. From the top of an 80 -ft tower, the angle of depression to a stake on the ground is $\mathbf{7 2}{ }^{\circ}$. How far is the stake from the foot of the tower?

$90^{-72}$fl.


$$
\begin{gathered}
\frac{\tan 72}{1}=\frac{80}{x} \\
x \cdot \tan 72=80 \\
x=\frac{80}{\tan 72} \\
x \approx 25.99^{\circ} \\
x \approx 26
\end{gathered}
$$

3. Skylar stands 200 feet from a building to measure its height using a surveying instrument that is 4 feet above the ground. The angle of elevation to the top of the building is $35^{\circ}$. How tall is the building?

4. Buildings $A$ and $B$ are across the street from each other, 35 meters apart. From a point on the roof of Building $A$, the angle of elevation to the top of Building $B$ is $24^{\circ}$ and the angle of depression to the base of Building $B$ is $\overline{34^{\circ}}$. How tall is each building?

5. $\tan 34=\frac{a}{35} \cdot 35$

$$
a=23.6 \mathrm{~m}
$$

$$
\begin{aligned}
\tan 24 & =\frac{b}{35} \\
b & =35 \cdot \tan 24 \\
b & \approx 15.6 \\
B & =23.6+15.6 \\
& =39.2 \mathrm{~m}
\end{aligned}
$$

Building $A$ is 23.6 meters
and Bldg B is 39.2 meters.

