Name: $\qquad$
Date: $\qquad$ Period: $\qquad$

LEARNiNG

- I can apply trigonometric ratios to real life problems.

TARGETS

## Angles of Elevation and Depression



Use the figure below for questions 1-4. Classify each angle as an angle of elevation or an angle of depression.

1. $\angle 1$ $\qquad$
2. $\angle 2$ $\qquad$
3. $\angle 3$ $\qquad$
4. $\angle 4$ $\qquad$
5. Noah is looking out Mrs. D'Emanuele's window and sees the top of the school flagpole at an angle of elevation of $22^{\circ}$. Noah is 18 feet above the ground and 50 feet from the flagpole. Find the height of the flagpole.
6. At a topiary garden, Maddie is 8 feet from a shrub that is shaped like a dolphin. From where she is standing, she measures the angle of elevation to the top of the shrub is $46^{\circ}$, using a transit that is 5 feet of the ground. What is the best estimate for the height of the shrub?
7. Shane is 61 feet high on a ride at an amusement park. The angle of depression to the park entrance is $42^{\circ}$, and the angle of depression to his friends standing below is $80^{\circ}$. How far from the entrance are his friends standing? Round to the nearest foot.

8. You are standing at point $A$ and are looking up at a very tall building. You measure the angle of elevation to be $22.3^{\circ}$ at point $A$ up to the top of the building. You now walk to point $B$ which is exactly 150 feet directly towards the building from point $A$. You then measure a new angle of elevation of $38.9^{\circ}$. Using this information, what is the height of the building?

$\qquad$
$\qquad$ Period: $\qquad$
1) The door on an airplane is 19 feet off the ground and there is a ramp that extends from the doorway to the ground. The ramp has a $31^{\circ}$ angle of elevation. What is the length of the ramp?
2) A hot air balloon is being observed by someone standing 1.8 miles away from the balloon measured along the ground. He measures an angle of elevation of $28^{\circ}$ from the ground. How high off the ground is the balloon?
3) You are on the west side of the Washington Monument which is 555 feet tall. Your friend is on the opposite (east) side. The angle of elevation from your position to the top of the monument is $42^{\circ}$. The angle of elevation from your friend's position to the top of the monument is $65^{\circ}$. How far are you from your friend?
4) A 9 foot ladder makes an angle of $55^{\circ}$ with the ground. How far is the bottom of the ladder from the base of the building?
5) Two buildings are 60 feet apart across a street. A person on top of the shorter building finds the angle of elevation to the roof of the taller building to be $20^{\circ}$. He also finds the angle of depression down to the base of the taller building to be $35^{\circ}$. How tall is the taller building?
6) You want to find the height of a tower used to transmit cell phone calls. You stand 100 feet away from the tower. Using a transit placed on a post 5 ft 8 in . off the ground, you measure the angle of elevation to be $40^{\circ}$. How tall is the tower?
7) You want to measure the height of a clock tower. You measure the angle of elevation to the top of the clock tower from where you are standing to be $25^{\circ}$. You walk 90 feet towards the tower and measure the angle of elevation from the new point to be $40^{\circ}$. Assuming you measure the angles of elevation on a transit that is 6 ft off the ground, how tall is the clock tower?

## Answer Key

1) 36.9 ft
2) 0.96 miles
3) 875.2 ft
4) 5.2 ft
5) 63.8 ft
6) $89.6 \mathrm{ft} \quad$ 7) 100.5 ft
