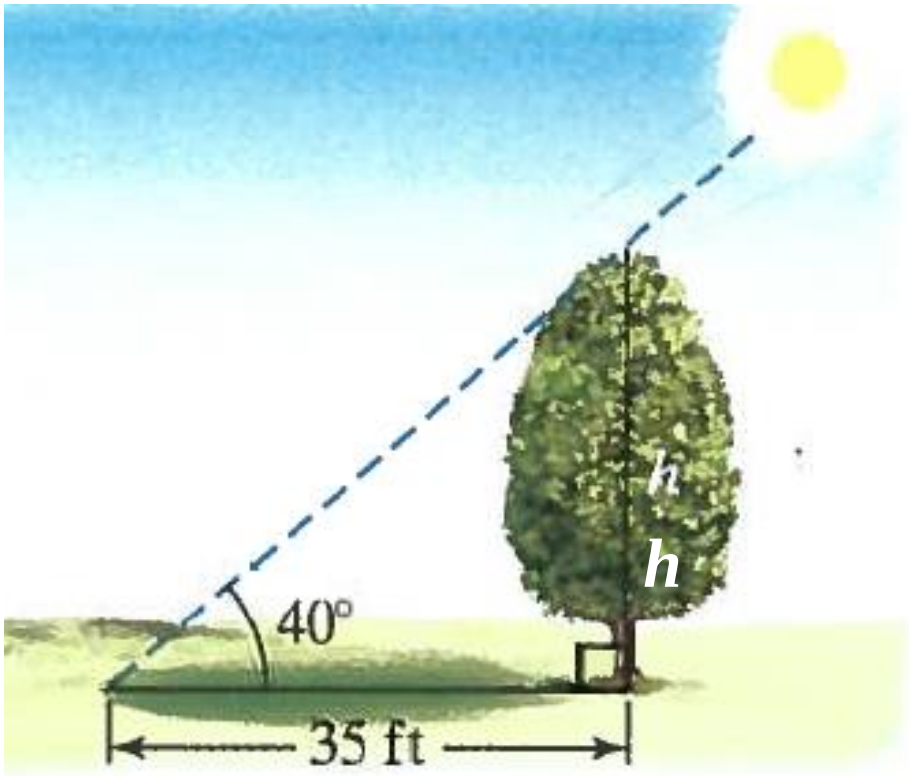
Applications of Right Triangle Trigonometry:

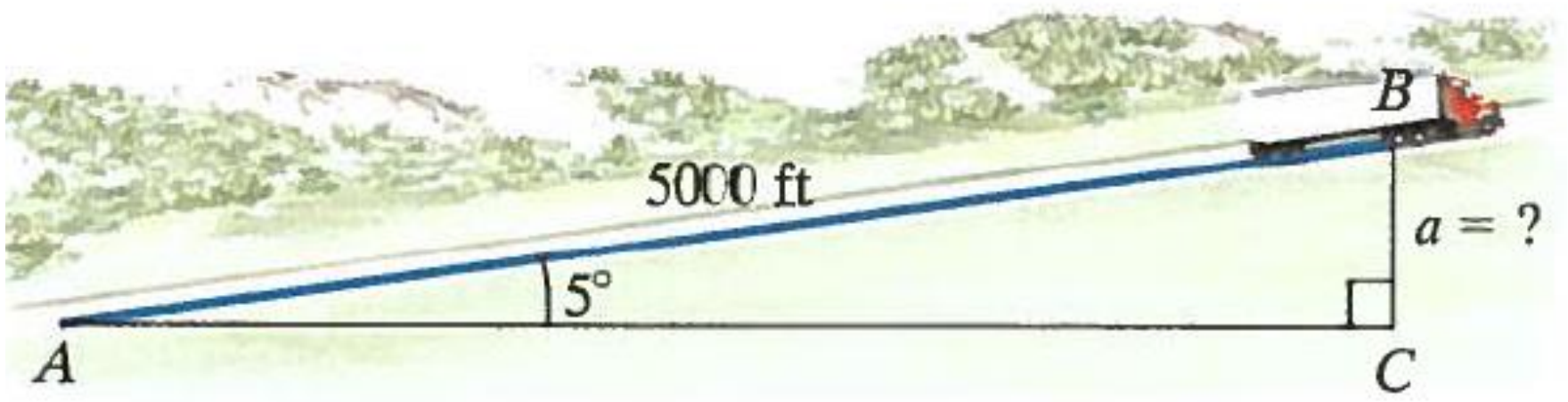
1. At a certain time of day, the angle of elevation of the Sun is $40°$. To the nearest foot, find the height of a tree whose shadow is 35 ft. long.

$$\tan 40° = \frac{h}{35} \Rightarrow h = 35\tan 40°$$

$$= 29.3684... = \boxed{29\ ft}$$



2. A road is inclined at an angle of $5°$. After driving 5,000 feet along this road, find the driver's increase in altitude to the nearest tenth of a foot.



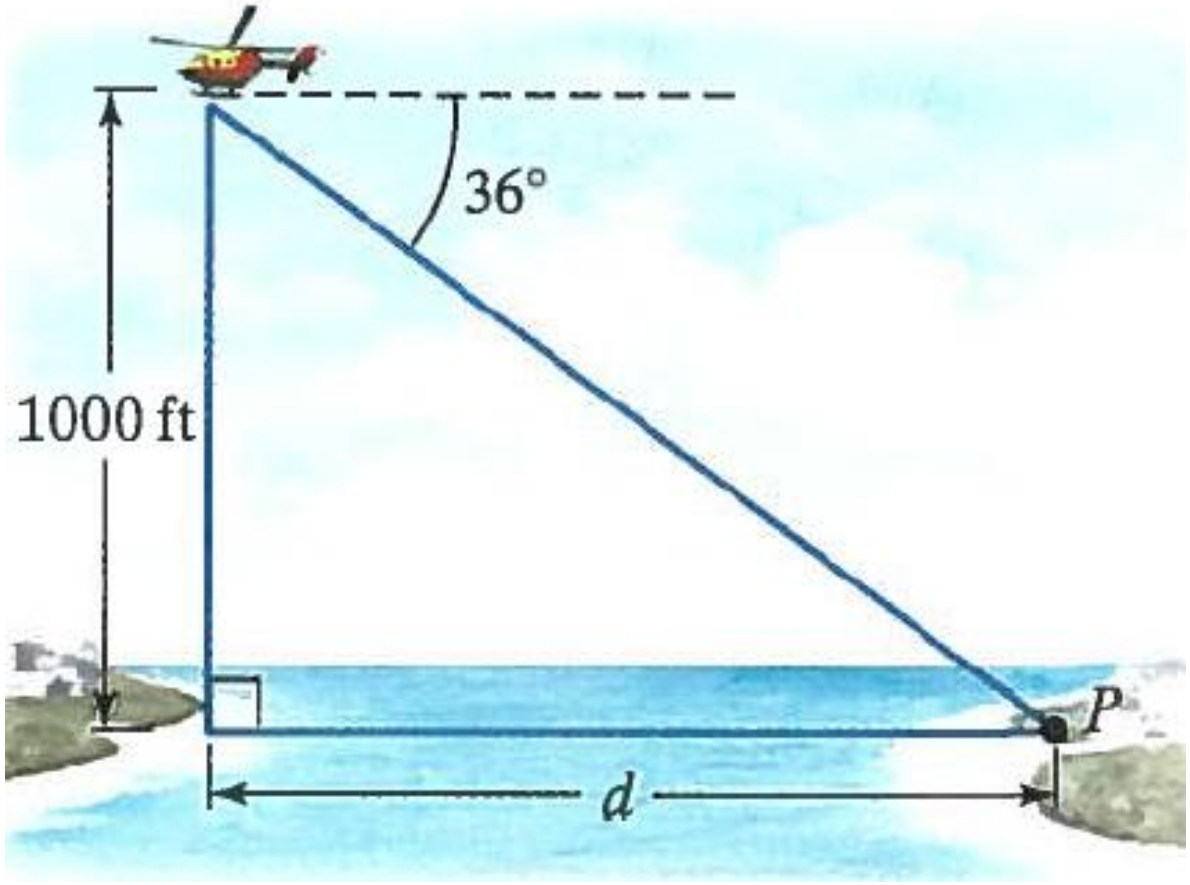
$$\sin 5° = \frac{a}{5{,}000} \Rightarrow a = 5{,}000 \sin 5° = 435.7787... = \boxed{435.8\ ft}$$

3. A helicopter hovers 1,000 feet above a small island. The figure indicates that the angle of depression from the helicopter to point *P* is $36°$. How far off the coast, to the nearest foot, is the island?

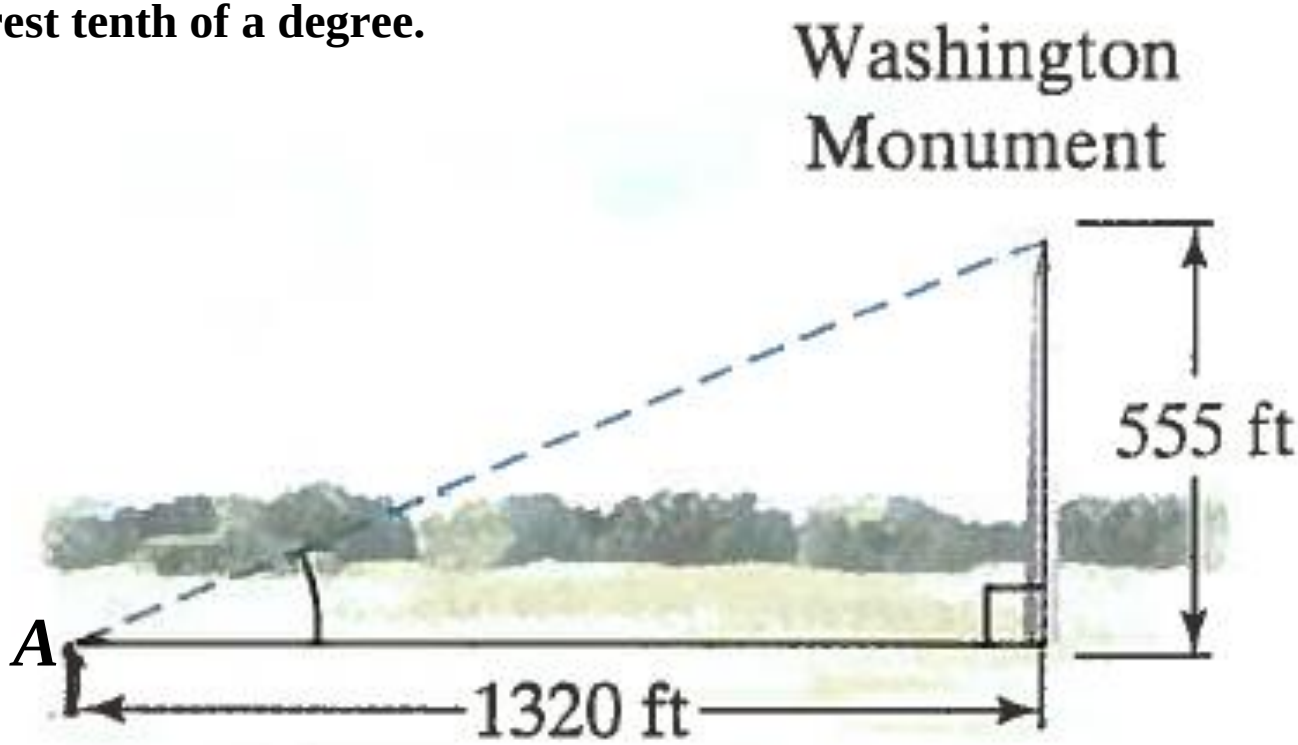
$$\tan(54°) = \frac{d}{1000} \Rightarrow$$

$$d = 1{,}000 \tan 54° = 1{,}376.3819\ldots$$

$$= \boxed{1{,}376\ ft}$$

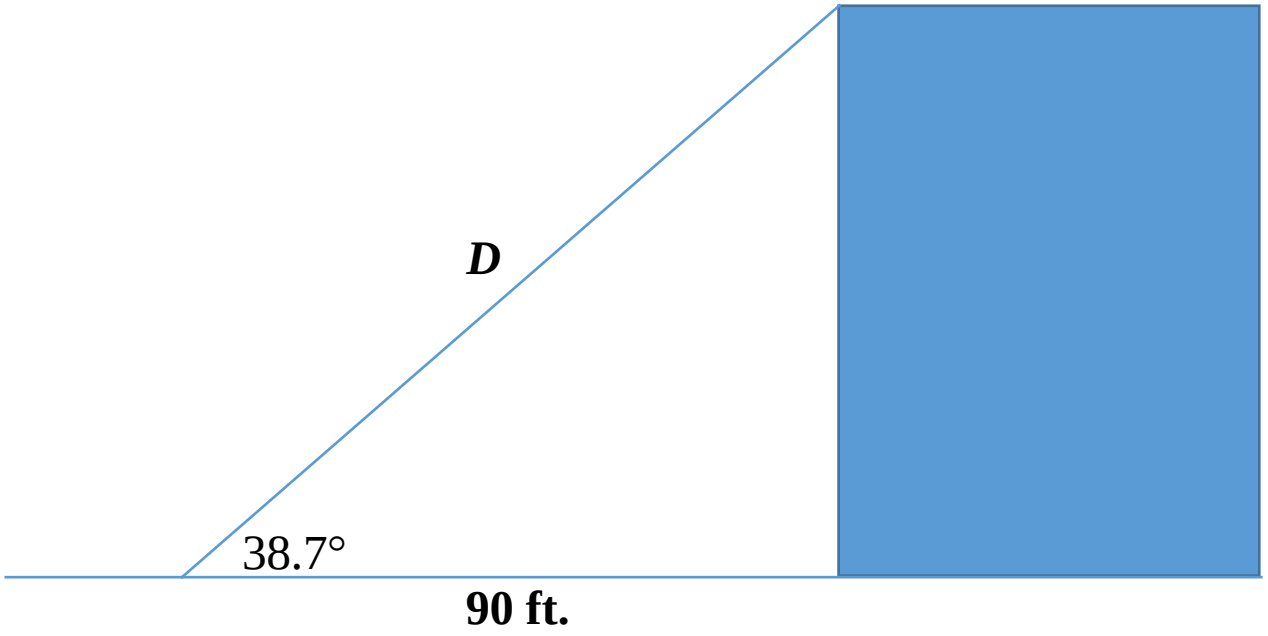


4. The Washington Monument is 555 feet high. If you stand one quarter of a mile, or 1,320 feet, from the base of the monument and look to the top, find the angle of elevation, *A*, to the nearest tenth of a degree.



$$\angle A = \tan^{-1}\frac{555}{1{,}320} = 22.8045\ldots = \boxed{22.8°}$$

5. From a point on level ground 90 feet from the base of a building, the angle of elevation to the top of the building is $38.7°$. Find the distance from the point on the ground to the top of the building to the nearest foot.



$$\cos 38.7° = \frac{90}{D} \Rightarrow D = \frac{90}{\cos 38.7°} = 115.3209... = \boxed{115\ ft}$$