The Law of Sines

Law of Sines

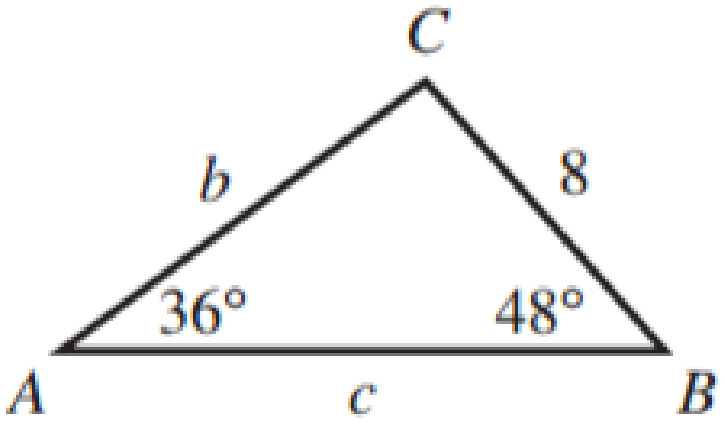
In any $\triangle ABC$ with angles A, B, and C opposite sides a, b, and c, respectively, the following equation is true:

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}.$$

Solving Triangles (AAS, ASA)

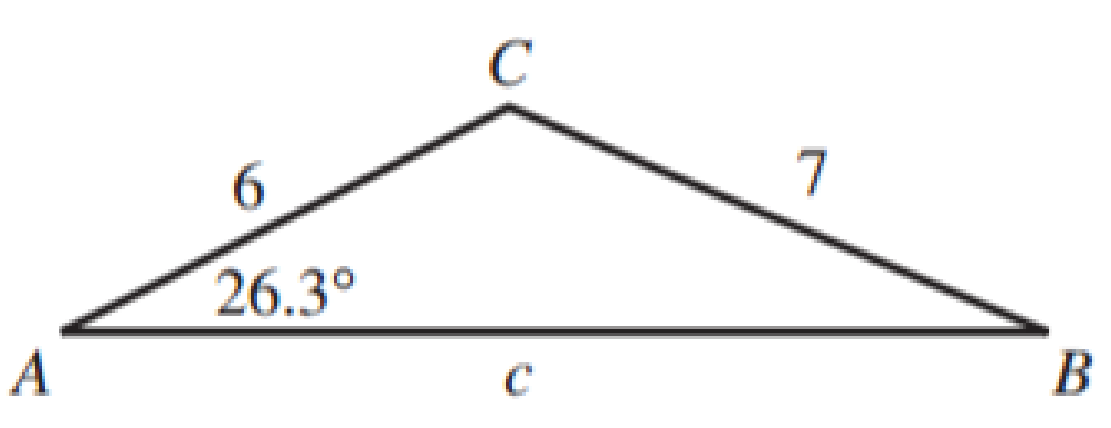
EXAMPLE 1 Solving a Triangle Given Two Angles and a Side

Solve $\triangle ABC$ given that $\angle A = 36°$, $\angle B = 48°$, and $a = 8$.



EXAMPLE 2 Solving a Triangle Given Two Sides and an Angle

Solve $\triangle ABC$ given that $a = 7$, $b = 6$, and $\angle A = 26.3°$.



EXAMPLE 4 Locating a Fire

Forest Ranger Chris Johnson at ranger station A sights a fire in the direction 32° east of north. Ranger Rick Thorpe at ranger station B, 10 miles due east of A, sights the same fire on a line 48° west of north. Find the distance from each ranger station to the fire.

EXAMPLE 3 Handling the Ambiguous Case

Solve $\triangle ABC$ given that $a = 6$, $b = 7$, and $\angle A = 30°$.