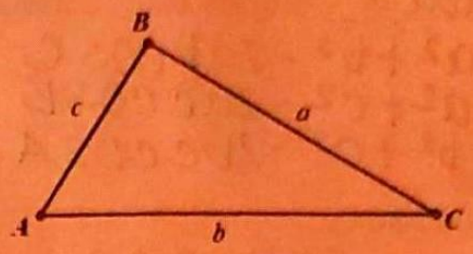
Law of Sines

Law of Sines...

Let ΔABC be any triangle with sides a, b, and c and opposite angles A, B, & C respectively, then:

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

Conditions: AAS or ASA

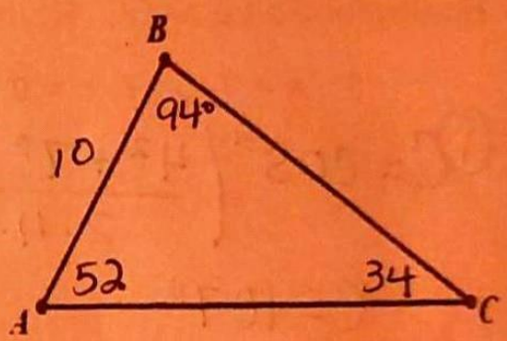


Example. Solve ΔABC.

1. A = 52°, C = 34°, and c = 10.

① $\angle B = 180 - (52 + 34) = 94^\circ$

② $\frac{\sin 52}{a} = \frac{\sin 94}{b} = \frac{\sin 34}{10}$



$\frac{\sin 52}{a} = \frac{\sin 34}{10}$ $\quad$ $\frac{\sin 94}{b} = \frac{\sin 34}{10}$

$a\sin 34 = 10\sin 52$ $\quad$ $b\sin 34 = 10\sin 94$

$\frac{a\sin 34}{\sin 34} = \frac{10\sin 52}{\sin 34}$ $\quad$ $\frac{b\sin 34}{\sin 34} = \frac{10\sin 94}{\sin 34}$

$a = 14.1$ $\quad$ $b = 17.8$

A = 52° $\quad$ a = 14.1

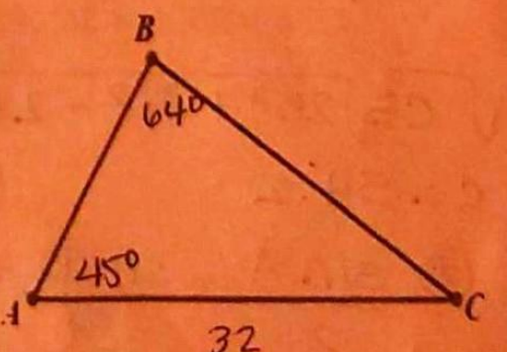
B = 94° $\quad$ b = 17.8

C = 34° $\quad$ c = 10

2. A = 45°, B = 64°, b = 32.

$\angle C = 180 - (45 + 64)$

$\frac{\sin 45}{a} = \frac{\sin 64}{32} = \frac{\sin 71}{c}$



$a\sin 64 = 32\sin 45$ $\quad$ $c\sin 64 = 32\sin 71$

$a = \frac{32\sin 45}{\sin 64}$ $\quad$ $c = \frac{32\sin 71}{\sin 64}$

$a = 25.2$ $\quad$ $c = 33.7$

A = 45° $\quad$ a = 25.2

B = 64° $\quad$ b = 32

C = 71° $\quad$ c = 33.7