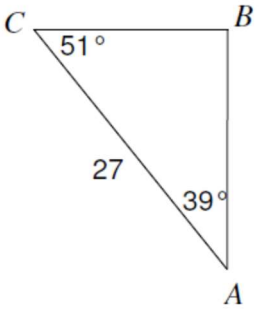
Name: _____ Date: _____

Learning Goal 2.3	Use of sine and cosine laws to solve non-right triangles, including ambiguous cases.

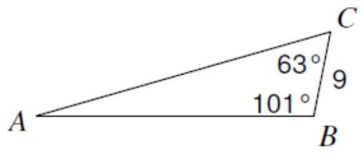
1. Find side a.



$\measuredangle B = 180° - 51° - 39°$
$= 90°$

$$\frac{\sin A}{a} = \frac{\sin B}{b}$$
$$\frac{\sin 39°}{a} = \frac{\sin 90°}{27}$$
$$27 \times \sin 39° = a \times \sin 90°$$
$$\frac{27 \times \sin 39°}{\sin 90°} = a$$
$$a = 17$$

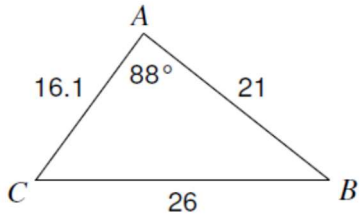
2. Find side c.



$\measuredangle A = 180° - 63° - 101°$
$= 16°$

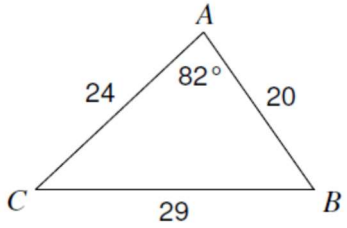
$$\frac{\sin A}{a} = \frac{\sin C}{c}$$
$$\frac{\sin 16}{9} = \frac{\sin 63}{c}$$
$$c \times \sin 16 = 9 \times \sin 63$$
$$c = \frac{9 \times \sin 63}{\sin 16}$$
$$c = 29.1$$

3. Find $\measuredangle C$.



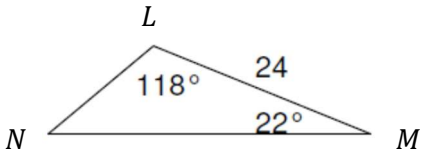
$$\frac{\sin A}{a} = \frac{\sin C}{c}$$
$$\frac{\sin 88}{26} = \frac{\sin C}{21}$$
$$21 \times \frac{\sin 88}{26} = \sin C$$
$$\sin^{-1}\left(21 \times \frac{\sin 88}{26}\right) = C$$
$$C = 54°$$

4. In $\Delta ABC, \measuredangle A = 82°$, $a = 29$ m and $b = 24$ m. Determine the measure of $\measuredangle C$ to the nearest degree.



$$\frac{\sin A}{a} = \frac{\sin C}{c}$$
$$\frac{\sin 82}{29} = \frac{\sin C}{20}$$
$$20 \times \frac{\sin 82}{29} = \sin C$$
$$\sin^{-1}\left(20 \times \frac{\sin 82}{29}\right) = C$$
$$C = 43°$$

5. In $\Delta LMN, \measuredangle L = 118°$, $\measuredangle M = 22°$ and $n = 24$ cm. Determine the measure of m to the nearest tenth of a metre.



$$\begin{aligned}\measuredangle A &= 180° - 118° - 22° \\ &= 40°\end{aligned}$$

$$\frac{\sin M}{m} = \frac{\sin N}{n}$$

$$\frac{\sin 22}{m} = \frac{\sin 40}{24}$$

$$24 \times \sin 22 = m \times \sin 40$$

$$\frac{24 \times \sin 22}{\sin 40} = m$$

$$m = 14$$