Math 20-2

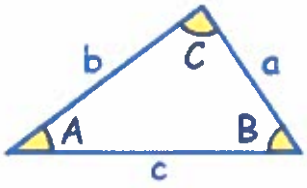
■Key■

L48 – Sine Law

Key Ideas

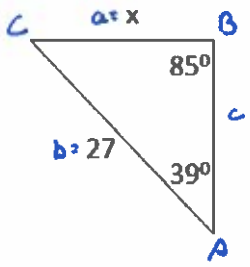
Sine Law:

$$\frac{SinA}{a} = \frac{Sin\,B}{b} = \frac{Sin\,C}{c} \quad \text{or} \quad \frac{a}{Sin\,A} = \frac{b}{Sin\,B} = \frac{c}{Sin\,C}$$



Part 1 – Solving for a Side

Q1: Find the length of *x*.



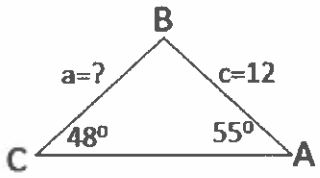
$\frac{Sin\,A}{a} = \frac{Sin\,B}{b}$

$\frac{Sin\,39}{x} = \frac{Sin\,85}{27}$

$\frac{0.629}{x} = \frac{0.996}{27}$

$x = 17.1$

Q2: Find the length of *a*.



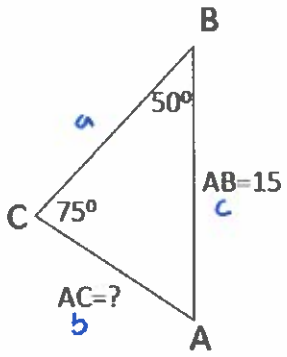
$\frac{Sin\,A}{a} = \frac{Sin\,C}{c}$

$\frac{Sin\,55}{a} = \frac{Sin\,48}{12}$

$\frac{0.819}{a} = \frac{0.743}{12}$

$a = 13.2$

Q3: Find the length of *AC*



$\frac{Sin\,B}{b} = \frac{Sin\,C}{c}$

$\frac{Sin\,50}{AC} = \frac{Sin\,75}{15}$

$\frac{0.766}{AC} = \frac{0.966}{15}$

$AC = 11.9$

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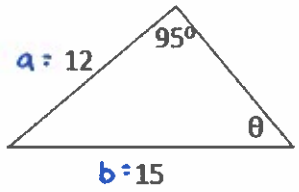
KEY

Part 2 – Solving for an Angle

Q4: Solve for θ.



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

$\frac{\sin\theta}{12} = \frac{\sin 95}{15}$

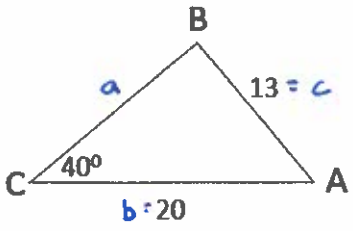
$\frac{\sin\theta}{12} = \frac{0.996}{15}$

$\sin\theta = 0.796\ldots$

$\theta = \sin^{-1}(0.796\ldots)$

$\theta = 52.8°$

Q5: Solve for ∠B.



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

$\frac{\sin B}{20} = \frac{\sin 40}{13}$

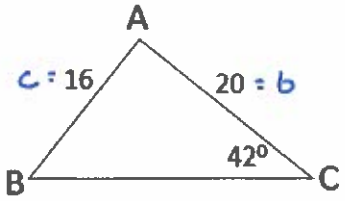
$\frac{\sin B}{20} = \frac{0.642}{13}$

$\sin B = 0.9889\ldots$

$B = \sin^{-1}(0.9889\ldots)$

$\angle B = 81.5°$

Q6: Solve for ∠ABC.



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

$\frac{\sin B}{20} = \frac{\sin 42}{16}$

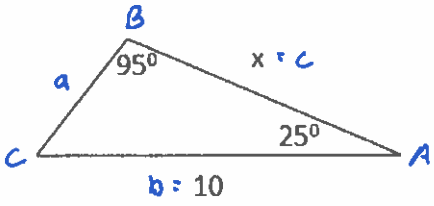
$\frac{\sin B}{20} = \frac{0.669}{16}$

$\sin B = 0.836\ldots$

$B = \sin^{-1}(0.836\ldots)$

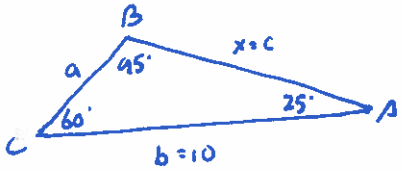
$\angle B = 56.8°$

Q7: Solve for x.



$95° + 25° + \angle C = 180°$

$\angle C = 60°$



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

$\frac{\sin 95}{10} = \frac{\sin 60}{x}$

$\frac{0.996}{10} = \frac{0.866}{x}$

$x = 8.69$