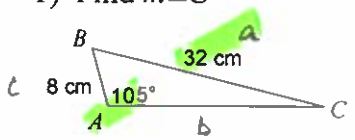
Math 20-2 Name_____

Law of Sines or Law of Cosines

Date_____

Decide if Law of Sines or Law of Cosines, why? Write the formula. Determine the measurement indicated. Round sides to nearest tenth; round angles to the nearest degree

1) Find $m\angle C$



LAW OF SINES

Know A and a

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

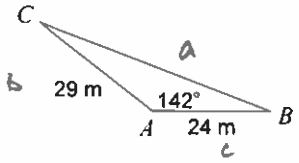
$$\frac{32}{\sin 105} = \frac{8}{\sin C}$$

$$\sin C = \frac{8(\sin 105)}{32} = 0.2415$$

$$C = \sin^{-1}(0.2415)$$

$$C = 14°$$

2) Find BC



LAW of COSINES

Know two sides and angle between.

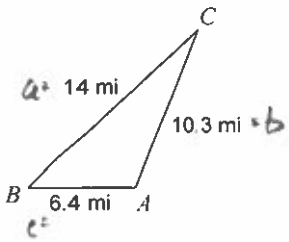
$$a^2 = b^2 + c^2 - 2bc\cos A$$

$$a^2 = 29^2 + 24^2 - 2(29)(24)\cos 142$$

$$a^2 = 2513.9$$

$$a = 50.1 \text{ m}$$

3) Find $m\angle A$



LAW OF COSINES

know 3 sides, no angles

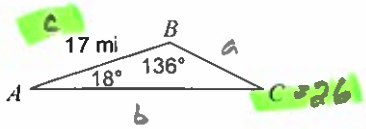
$$\cos A = \frac{b^2 + c^2 - a^2}{2bc}$$

$$\cos A = \frac{10.3^2 + 6.4^2 - 14^2}{2(10.3)(6.4)} = \frac{-48.95}{131.84} = -0.3713$$

$$A = \cos^{-1}(-0.3713)$$

$$A = 112^\circ$$

4) Find AC = b



LAW of SINES

know two angles ∴ know three angles

know C and c

$C = 180 - 136 - 18$

$C = 26$

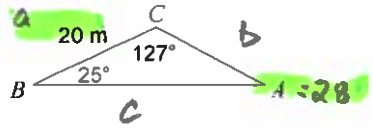
$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{b}{\sin 136} = \frac{17}{\sin 26}$$

$$b = \frac{17(\sin 136)}{\sin 26}$$

$$b = 26.9 \text{ mi}$$

5) Find AB = c



LAW of SINES

know two angles ∴ know three angles

know A and a

$A = 180 - 127 - 25$

$A = 28$

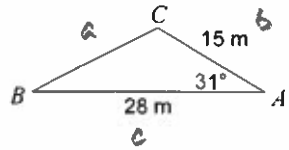
$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{20}{\sin 28} = \frac{c}{\sin 127}$$

$$c = \frac{20(\sin 127)}{\sin 28}$$

$$c = 34.0 \text{ m}$$

6) Find BC = a



Law of Cosines

Know two sides and angle between

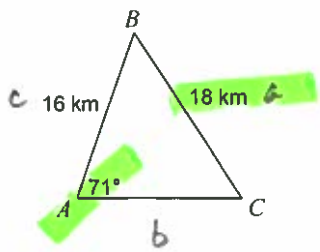
$a^2 = b^2 + c^2 - 2bc\cos A$

$a^2 = 15^2 + 28^2 - 2(15)(28)\cos 31$

$a^2 = 289.98$

$a = 17.0$ m

7) Find $m\angle C$



Law of Sines

Know A and a

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

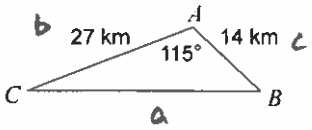
$\frac{18}{\sin 71} = \frac{16}{\sin C}$

$\sin C = \frac{16(\sin 71)}{18} = 0.8405$

$C = \sin^{-1}(0.8405)$

$C = 57°$

8) Find BC = a



Law of Cosines

Know two sides and angle between

$a^2 = b^2 + c^2 - 2bc\cos A$

$a^2 = 27^2 + 14^2 - 2(27)(14)\cos 115$

$a^2 = 1244.5$

$a = 35.3$ km