

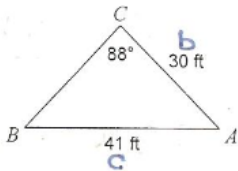
Foundations of Math 110

Name SOLUTIONS.

Law of Sines/Cosines Review

Date _____ Period _____

Find each measurement indicated.

1) Find $\angle B$ 

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

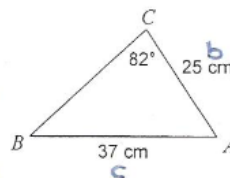
$$\frac{\sin B}{30} = \frac{\sin 88^\circ}{41}$$

$$41 \sin B = \frac{30 \sin 88^\circ}{41}$$

$$\sin B = 0.7313$$

$$B = \sin^{-1}(0.7313)$$

$$B = 47^\circ$$

2) Find $\angle B$ 

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

$$\frac{\sin B}{25} = \frac{\sin 82^\circ}{37}$$

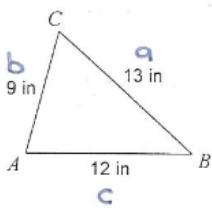
$$37 \sin B = \frac{25 \sin 82^\circ}{37}$$

$$\sin B = 0.6691$$

$$B = \sin^{-1}(0.6691)$$

$$B = 42^\circ$$

3) Find $\angle C$



$$\cos C = \frac{a^2 + b^2 - c^2}{2ab}$$

$$\cos C = \frac{(13)^2 + (9)^2 - (12)^2}{2(13)(9)}$$

$$\cos C = \frac{169 + 81 - 144}{234}$$

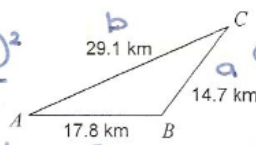
$$\cos C = \frac{106}{234}$$

$$\cos C = 0.4530$$

$$C = \cos^{-1}(0.4530)$$

$$C = 63^\circ$$

4) Find $\angle C$



$$\cos C = \frac{a^2 + b^2 - c^2}{2ab}$$

$$\cos C = \frac{(14.7)^2 + (29.1)^2 - (17.8)^2}{2(14.7)(29.1)}$$

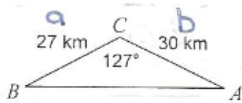
$$\cos C = \frac{216.09 + 846.81 - 316.84}{855.54}$$

$$\cos C = \frac{746.06}{855.54}$$

$$\cos C = 0.8720$$

$$C = \cos^{-1}(0.8720)$$

$$C = 29^\circ$$

5) Find c 

$$c^2 = a^2 + b^2 - 2ab \cos C$$

$$c^2 = (27)^2 + (30)^2 - 2(27)(30)\cos 127^\circ$$

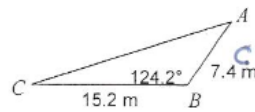
$$c^2 = 729 + 900 - 1620(-0.6018)$$

$$c^2 = 1629 + 974.916$$

$$c^2 = 2603.916$$

$$c = \sqrt{2603.916}$$

$$c = 51 \text{ km}$$

6) Find b 

$$b^2 = a^2 + c^2 - 2ac \cos B$$

$$b^2 = (15.2)^2 + (7.4)^2 - 2(15.2)(7.4)\cos 124.2^\circ$$

$$b^2 = 231.04 + 54.76 - 224.96(-0.5621)$$

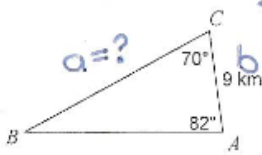
$$b^2 = 285.8 + 126.4500$$

$$b^2 = 412.25$$

$$b = \sqrt{412.25}$$

$$b = 20.3 \text{ m}$$

7) Find a



$$\angle B = 180^\circ - 70^\circ - 82^\circ$$

$$\angle B = 28^\circ$$

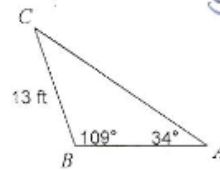
$$\frac{a}{\sin A} = \frac{b}{\sin B}$$

$$\frac{a}{\sin 82^\circ} = \frac{9}{\sin 28^\circ}$$

$$\frac{a \sin 28^\circ}{\cancel{\sin 28^\circ}} = \frac{9 \sin 82^\circ}{\sin 28^\circ}$$

$$a = 19.0 \text{ km}$$

8) Find b



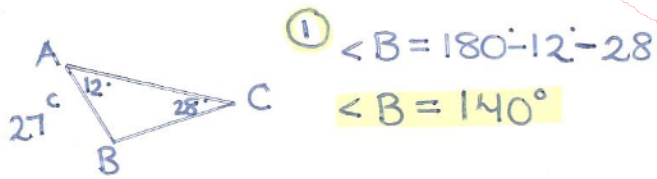
$$\frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{b}{\sin 109^\circ} = \frac{13}{\sin 34^\circ}$$

$$\frac{b \sin 34^\circ}{\cancel{\sin 34^\circ}} = \frac{13 \sin 109^\circ}{\sin 34^\circ}$$

$$b = 22.0 \text{ ft}$$

9) $\angle C = 28^\circ$, $\angle A = 12^\circ$, $c = 27$ cm



② $\frac{a}{\sin A} = \frac{c}{\sin C}$ ③ $\frac{b}{\sin B} = \frac{c}{\sin C}$

$\frac{a}{\sin 12^\circ} = \frac{27}{\sin 28^\circ}$ $\frac{b}{\sin 140^\circ} = \frac{27}{\sin 28^\circ}$

$\frac{a \sin 28^\circ}{\sin 28^\circ} = \frac{27 \sin 12^\circ}{\sin 28^\circ}$ $\frac{b \sin 28^\circ}{\sin 28^\circ} = \frac{27 \sin 140^\circ}{\sin 28^\circ}$

$a = 12.0$ cm

$b = 37.0$ cm

10) $b = 13$ km, $a = 21$ km, $c = 29$ km

①

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

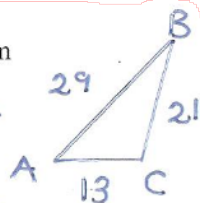
$$\cos A = \frac{(13)^2 + (29)^2 - (21)^2}{2(13)(29)}$$

$$\cos A = \frac{169 + 841 - 441}{754}$$

$$\cos A = \frac{569}{754}$$

$$\cos A = 0.7546$$

$$A = 41^\circ$$



②

$$\cos B = \frac{a^2 + c^2 - b^2}{2ac}$$

$$\cos B = \frac{(21)^2 + (29)^2 - (13)^2}{2(21)(29)}$$

$$\cos B = \frac{441 + 841 - 169}{1218}$$

$$\cos B = \frac{1113}{1218}$$

$$\cos B = 0.9138$$

$$B = 24^\circ$$

$$\textcircled{3} \angle C = 180^\circ - 41^\circ - 24^\circ$$

$$\angle C = 115^\circ$$