ERL MCR UNIT 5

January 16, 2018 4:11 PM

UNIT 5
MCR 3UI ...

UNIT 5 MCR 3UI Exam Review

1. Solve for A , $0° \leq A \leq 360°$

$sinA = \frac{-\sqrt{3}}{2}$

Recall: $\sin 60° = \frac{\sqrt{3}}{2}$

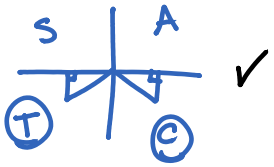
So, $\beta = 60°$ ✓

$A = 180° + 60°$

$A = 240°$

OR $A = 360° - 60°$

$A = 300°$



✓

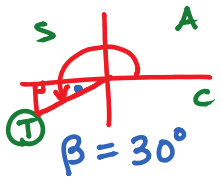
$\therefore$ A = 240° or 300°

2. Solve for x. (No Decimals!)

$x = cos210°$

$x = -\cos 30°$

$x = -\frac{\sqrt{3}}{2}$



* For proofs, Left side and Right side MUST be separated.

3. Prove.

a) $1 - sin^2\theta = cos\theta sin\theta cot\theta$

LS

$cos^2\theta$ (PI)

RS

$cos\theta sin\theta \frac{1}{tan\theta}$ (RI)

$= cos\theta \cancel{sin\theta} \frac{cos\theta}{\cancel{sin\theta}}$ (QI)

$= cos^2\theta$

$= LS$

$\therefore 1 - sin^2\theta = cos\theta sin\theta cot\theta$

b) $1 + cot^2\theta = csc^2\theta$

LS

$1 + \frac{1}{tan^2\theta}$ (RI)

$= 1 + \frac{cos^2\theta}{sin^2\theta}$ (QI)

MUST get a common denominator.

$= \frac{sin^2\theta}{sin^2\theta} + \frac{cos^2\theta}{sin^2\theta}$

$= \frac{sin^2\theta + cos^2\theta}{sin^2\theta}$

$= \frac{1}{sin^2\theta}$ (PI) $= csc^2\theta$ (RI)

$= RS$

$\therefore 1 + cot^2\theta = csc^2\theta$

c) $\frac{1}{\sin\theta+1} - \frac{1}{\sin\theta-1} = \frac{2}{\cos^2\theta}$

One fraction on RS
two fractions on LS
... get a common denominator on LS.

LS

$$\frac{1(\sin\theta-1)-1(\sin\theta+1)}{(\sin\theta+1)(\sin\theta-1)}$$

$$= \frac{\sin\theta-1-\sin\theta-1}{\sin^2\theta-1}$$

$$= \frac{-2}{\sin^2\theta-1} \times \frac{-1}{-1}$$

note: aiming for numerator equals positive 2.

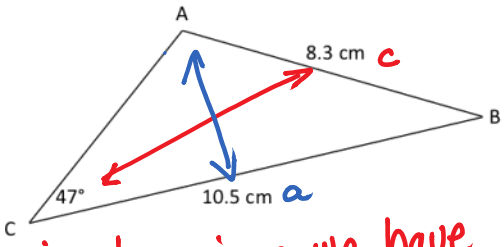
$$= \frac{2}{1-\sin^2\theta}$$

$$= \frac{2}{\cos^2\theta} \quad (PI)$$

$$= RS$$

$$\therefore \frac{1}{\sin\theta+1} - \frac{1}{\sin\theta-1} = \frac{2}{\cos^2\theta}$$

4. Solve the triangle. Round sides to nearest tenth of a cm, round angles to the nearest degree.



sine law since we have a complete side/angle pair.

$\frac{\sin A}{10.5} = \frac{\sin 47^\circ}{8.3}$ ✓

$\sin A = 10.5 \times \sin 47^\circ \div 8.3$

$\sin A = 0.9252$

$A = 67.69$

$A_1 \doteq 68^\circ$ ✓

$A_2 \doteq 180^\circ - 68^\circ$

$A_2 \doteq 112^\circ$

$B_1 \doteq 180^\circ - 47^\circ - 68^\circ$

$B_1 = 65^\circ$ ✓

$B_2 = 180^\circ - 159^\circ$

$= 21^\circ$

$b_1^2 = 10.5^2 + 8.3^2 - 2(10.5)(8.3)\cos 65^\circ$ ✓

$b_1 = \sqrt{105.47\ldots}$

$b_1 = 10.27$

$b_1 \doteq 10.3\text{ cm}$ ✓

$b_2^2 = 16.4\ldots$

$b_2 = \sqrt{16.4\ldots}$

$b_2 \doteq 4.051\ldots$

$b_2 \doteq 4.1\text{cm}$

$\therefore A_1 \doteq 68^\circ, B_1 \doteq 65^\circ, C = 47^\circ, b_1 \doteq 10.3\text{cm}$ OR

$A_2 = 112^\circ, B_2 \doteq 21^\circ, C = 47^\circ, b_2 \doteq 4.1\text{cm}.$ ✓