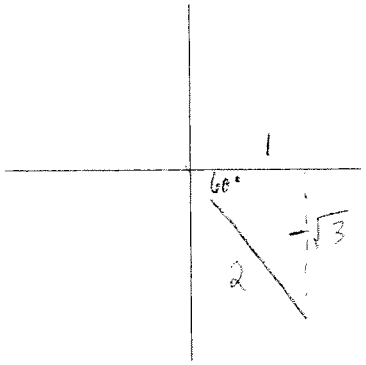
MCR3U – Unit 4 (Trigonometry) Quiz

Show all related work. **Name:** Answers

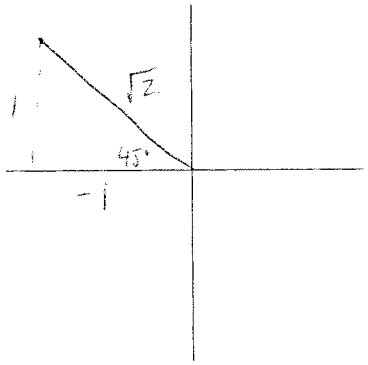
8 K **6 T** **4 C** **9 A** **27 Total**

1. Please give the **exact** trigonometric ratios that correspond to the following angles:

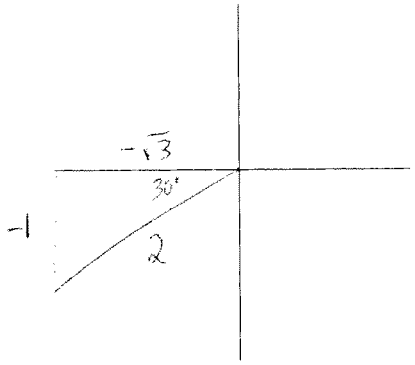
a) $\cos 300^\circ =$ $\frac{1}{2}$



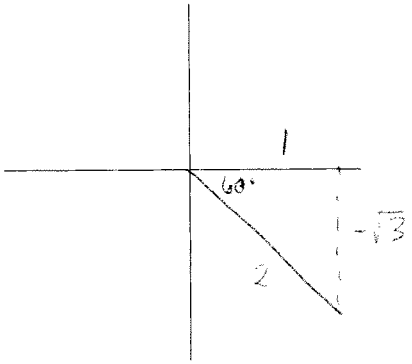
b) $\tan 135^\circ =$ $\frac{1}{-1}$



c) $\tan 210^\circ =$ $\frac{-1}{-\sqrt{3}}$



d) $\sin 300^\circ =$ $\frac{-\sqrt{3}}{2}$

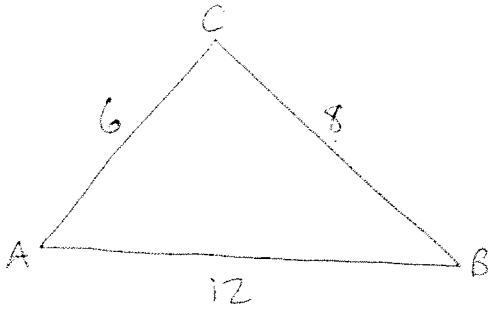


4 K

4 C

2. Solve triangle ABC if: a = 8 km, b = 6 km, c = 12 km.

3 A



$\cos C = \frac{8^2+6^2-12^2}{2(8)(6)}$

$= -0.4583$

$C = 117.3^\circ$

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

$\frac{12}{\sin 117.3^\circ} = \frac{6}{\sin B}$

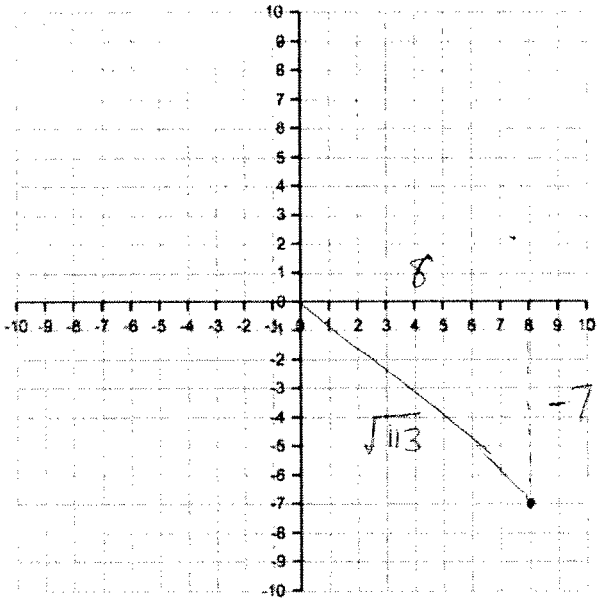
$\sin B = \frac{6(\sin 117.3^\circ)}{12}$

$\angle B = 26.38^\circ$

$\angle A = 180^\circ - 117.3^\circ - 26.38^\circ = 36.3^\circ$

3. What are the exact trigonometric ratios for the angle (θ) represented by a terminal arm that goes through (8 , -7)? [Please draw the terminal arm on the grid provided, and label the side lengths. Show any other work in the space below.]

$c^2 = 8^2 + (-7)^2$



4 K

$\sin\theta = \frac{-7}{\sqrt{113}}$ $\cos\theta = \frac{8}{\sqrt{113}}$ $\csc\theta = \frac{\sqrt{113}}{-7}$ $\sec\theta = \frac{\sqrt{113}}{8}$

$\tan\theta = \frac{-7}{8}$ $\cot\theta = \frac{8}{-7}$

4. Prove each of the following identities.

a) $\cot\theta\tan\theta\sec\theta\cos\theta = 1$

$LS = \left(\frac{1}{\tan\theta}\right)\tan\theta\left(\frac{1}{\cos\theta}\right)\cos\theta$

$= 1$ ✓

6 T

b) $\sin^2 x = \cos^2 x(\sec^2 x - 1)$

$RS = \cos^2 x\left(\frac{1}{\cos^2 x} - 1\right)$

$= \frac{\cos^2 x}{\cos^2 x} - \cos^2 x$

$= 1 - \cos^2 x$

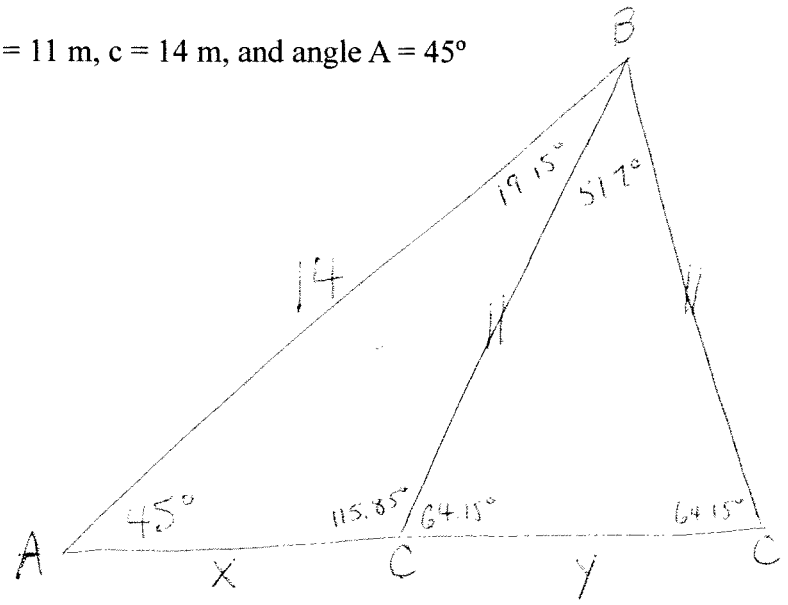
$= (\sin^2 x + \cos^2 x) - \cos^2 x$

$= \sin^2 x$ ✓

6. Solve **all** triangles that satisfy the given information. Be sure to show **how many** triangles can be formed.

a = 11 m, c = 14 m, and angle A = 45°

6 A



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

$\frac{14}{\sin C} = \frac{11}{\sin 45}$

$\sin C = \frac{14 \sin 45°}{11}$

$C = 64.15°$

$180° - 64.15° = 115.85°$

$180° - 45° - 115.85° = 19.15°$

$180° - 64.15° - 64.15° = 51.7°$

$\frac{x}{\sin 19.15°} = \frac{11}{\sin 45°}$

$x = \frac{11 \sin 19.15°}{\sin 45°}$

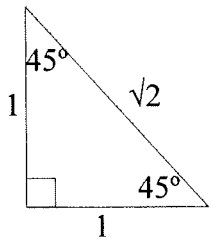
$x = 5.10$

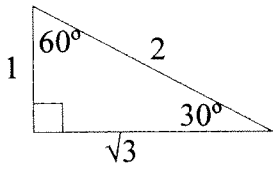
$\frac{y}{\sin 51.7°} = \frac{11}{\sin 64.15°}$

$y = \frac{11 \sin 51.70°}{\sin 64.15°}$

$y = 9.60$

Reference Material





$$\tan\theta=\frac{\sin\theta}{\cos\theta}$$

$$\sin^2\theta+\cos^2\theta=1$$

$$\csc q=\frac{1}{\sin q}$$

$$\sec q=\frac{1}{\cos q}$$

$$\cot q=\frac{1}{\tan q}$$

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

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

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