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MCR 3U - Unit 4 Test - Trigonometry Name: _____

T1: Determine the values of the trigonometric ratios for angles less than 360°, prove simple trigonometric identities and solve problems using the primary trigonometric rations, the sine law and the cosine law.

Self-Evaluation: % Homework Completed?	

Part A: With a calculator. Show all work. [18]
Round lengths to one place after decimal and angles to nearest degree.

1. State all possible angles, to the nearest degree, for $0° \le \theta \le 360°$, given [4]

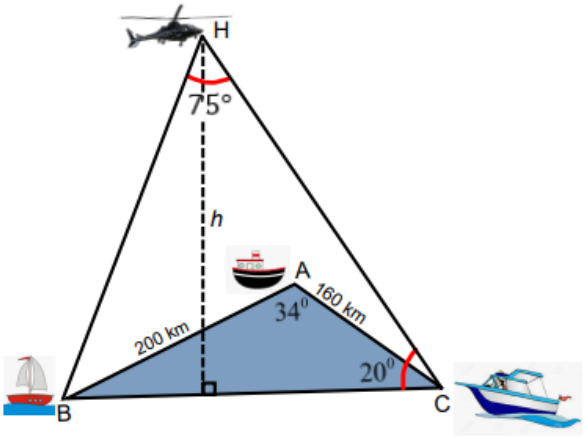
   a) $\tan\theta = -0.2773$ b) $sec\,\theta = 3.4203$

2. If $csc\theta = \frac{-5}{2}$, for $0° \le \theta \le 360°$ determine the value of: [3]

   a) $sin\theta$ b) $cos\theta$

3. A team of meteorologists is about to launch a weather balloon. There are two ropes attached to the balloon, which is in the air. Bahar's rope is $7.8\,m$ long and makes an angle of $36°$ with the ground. Nick's rope attached to the same balloon is $5.9\,m$ long. How far apart are Nick and Bahar standing? [4]

4. Determine the height of the helicopter. [4]



5. Prove the following identity: $\tan^2\theta - \sin^2\theta = \sin^2\theta \tan^2\theta$ [3]

Part B: Without a calculator. Show your thinking, where required. [24] **Name:**_____

6. State two other angles that have the same cosine ratios as $\cos 40°$ _____ [1]

7. Determine the exact trigonometric ratios. Show equivalent ratios when appropriate. [9]

a) $\cos 60°$ b) $\cot 30°$ c) $\cos 90°$

d) $\sin(-240°)$ e) $\cos 225°$ f) $\tan 150°$

8. If $\cos 60° = \sin\theta$, the value of θ is _____ [1]

9. State all possible angles for $0° \le \theta \le 360°$. [7]

a) $\tan\theta = -1$ b) $\tan\theta = \frac{-1}{\sqrt{3}}$ c) $sec\,\theta = \frac{2}{\sqrt{3}}$ d) $\sin\theta = -1$

10. Determine the exact value. Rationalize the denominator and simplify. **Show all of your work**. [3]

$(\cos 315°)(csc^2 30°) - (\sin 330°)(\tan^2 225°)$

11. Prove the following identities. [1. 2]

a) $\tan^2 x = \dfrac{1-\cos^2 x}{\cos^2 x}$

b) $\dfrac{\sin x + \cos x \cot x}{\cot x} = sec\, x$