

# MCR3U – Assignment 4 (Trigonometry)

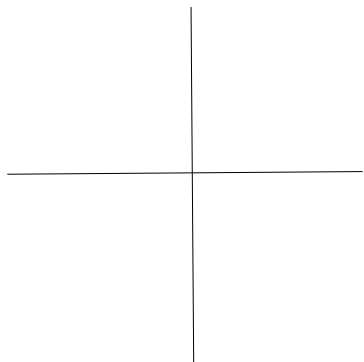
Show all related work.

Name: \_\_\_\_\_

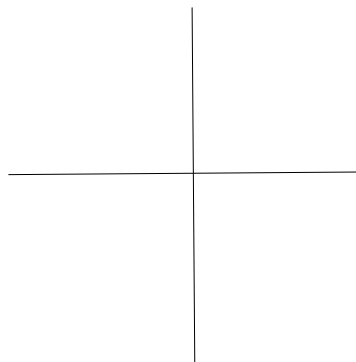
23 K   8 T   7 C   18 A   56 Total

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

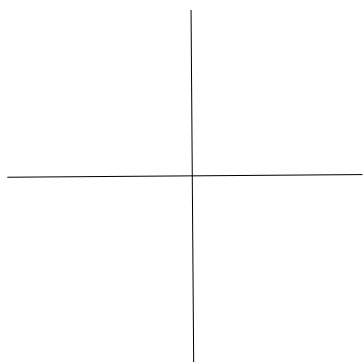
a)  $\cos 150^\circ =$



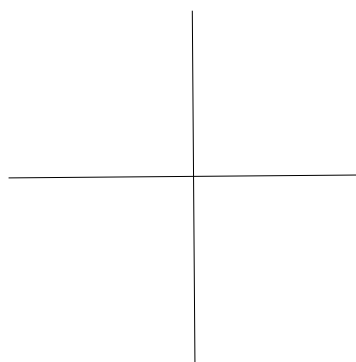
b)  $\tan 240^\circ =$



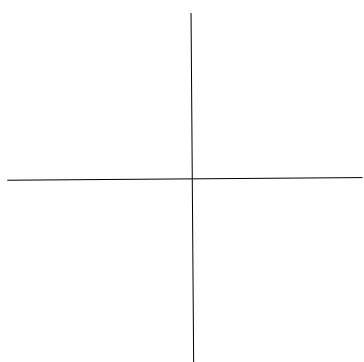
c)  $\tan 315^\circ =$



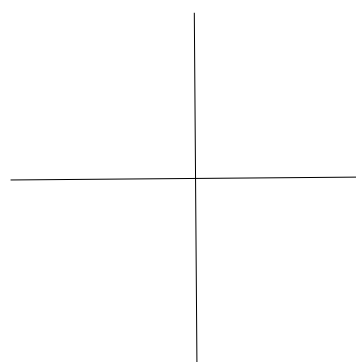
d)  $\sin 210^\circ =$



e)  $\csc 300^\circ =$



f)  $\sec 45^\circ =$

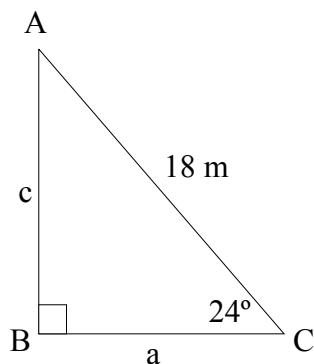


6 K

6 C

2. Please solve the following triangles FULLY. That is, give values for each of the following angles and sides. Please show ALL of your work, and don't forget UNITS:

a)



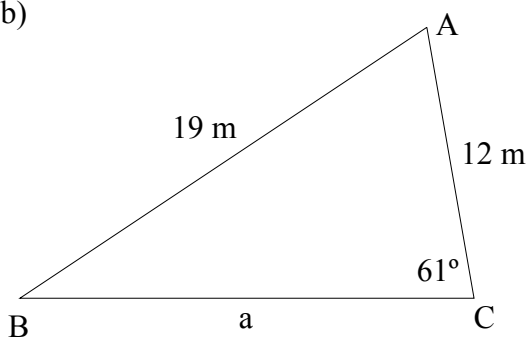
Angle A:

Side Length c:

Side Length a:

5 A

b)



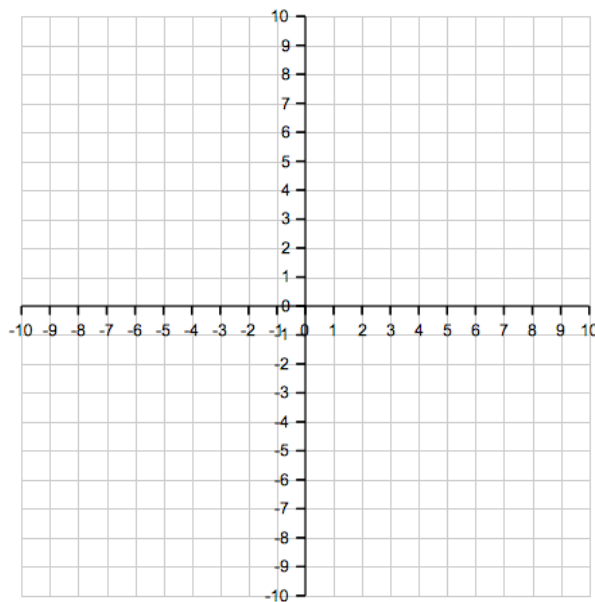
Angle A:

Angle B:

Side Length a:

5 A

3. What are the exact trigonometric ratios for the angle ( $\theta$ ) 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.]



7 K

$$\sin \theta = \boxed{\phantom{000}}$$

$$\cos \theta = \boxed{\phantom{000}}$$

$$\csc \theta = \boxed{\phantom{000}}$$

$$\sec \theta = \boxed{\phantom{000}}$$

$$\tan \theta = \boxed{\phantom{000}}$$

$$\cot \theta = \boxed{\phantom{000}}$$

4. Prove that  $\tan^2 \theta + 1 = \frac{1}{\cos^2 \theta}$

3 T

5. Prove that  $\tan \theta \sin \theta = \frac{1}{\cos \theta} - \cos \theta$

3 T

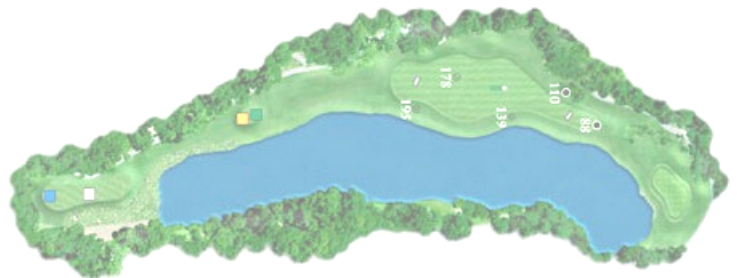
6. Solve **all** triangles that satisfy the given information. Be sure to show **how many** triangles can be formed.

$a = 5$  m,  $b = 8.5$  m, and angle  $A = 35^\circ$

6 A

7. The green on a golf hole lies 400 yards directly **east** of the tee, with a water hazard in between the tee and the green. If a golfer's first shot travels 250 yards from the tee at an angle of  $18^\circ$  [to the north of east] and lands on the fairway, how far will the golfer have to hit the second shot from the fairway in order to land on the green? Include a diagram.

3 K



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

**$\overline{3\text{ K}}$**

9. a) Find the exact trigonometric ratios for  $\sin 45^\circ$  and  $\sin 135^\circ$ .

**$\overline{2\text{ A}}$**

- b) Explain why these two trigonometric ratios are the same.

**$\overline{1\text{ C}}$**

10. Use the basic identities provided above to prove the following identities.

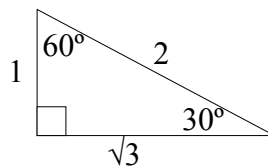
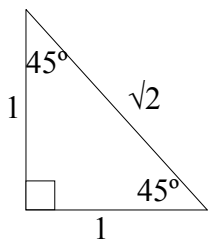
**$\overline{4\text{ K}}$**

a)  $\cot \theta \sin \theta \sec \theta = 1$

b)  $\sin q (1 + \tan q) = \tan q (\sin q + \cos q)$

**$\overline{2\text{ T}}$**

## Reference Material



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

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

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

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

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