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| /21K | /8A | /4C | /12T | Total | /45 |
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Name: _____ Date: _____

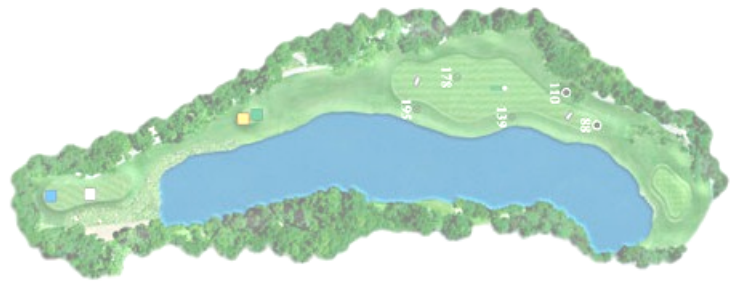
MCR3U

Test: Trigonometry

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

/3
A

1. 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° [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.



/2
T

2. Determine another angle between 0 and 360 degrees that has the same trigonometric ratio as each angle given.

a) $\sin 110^\circ$

b) $\cos 40^\circ$

/5
A

3. A surveyor is on one side of a river and wants to measure the height of a cliff on the other side of the river. She measures a baseline of 50 m from A to B and then measures angle ABC to be 65 degrees when point C is at the base of the cliff. She walks to point A and measures angle CAB to be 70 degrees. Then the angle of elevation (angle CAD) is 53 degrees to point D on the top of the cliff (above point C). Draw a diagram to represent this situation and determine the height of the cliff.

/2
C

/3
K

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

/2
T

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K

5. Determine an exact value for $\cos \theta$ if the point $(5, -4)$ lies on the terminal arm of θ .

/3
K

6. Determine the missing angles in triangle ABC if: $B = 37^\circ$, $b = 9$ m, $c = 14$ m.

/2
T

/4
T

7. If the angle θ lies in the second quadrant and $\sin \theta = \frac{5}{13}$, determine an exact value for $\tan \theta$.

/2
C

8. Explain why there are two angles between 0 and 360 degrees with the same sine ratio.

/5
K

9. Determine the exact value of each trigonometric ratio.

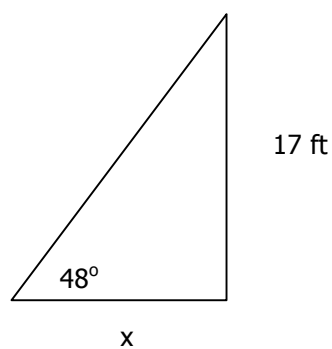
a) $\sin 45^\circ$

b) $\cos 150^\circ$

c) $\tan 240^\circ$

/3
K

10. Determine the unknown side in this right angle triangle using a reciprocal trigonometric ratio.



| | | | | |
|---|-------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| $\tan \theta = \frac{\sin \theta}{\cos \theta}$ | $\sin^2 \theta + \cos^2 \theta = 1$ | $\csc \theta = \frac{1}{\sin \theta}$ | $\sec \theta = \frac{1}{\cos \theta}$ | $\cot \theta = \frac{1}{\tan \theta}$ |
|---|-------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|

/4
K

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

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

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

/2
T