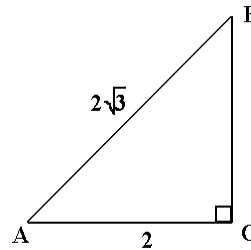


**Harford Community College – S.T.E.M Division**  
**MATH 103: Trigonometry – Fall 2009**  
**Homework #2: 2.1 – 2.4**  
**Due: 9\22\09**

**Directions:** Solve each of the following problems on separate paper. Staple everything together with your name on each sheet of paper and submit by the due date. Show work when necessary; **otherwise, the problem becomes all or nothing**. **Simplify the final answer unless otherwise indicated and keep all answers as exact.**

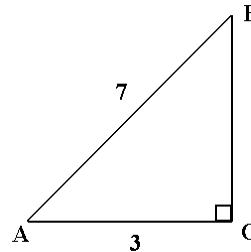
- 1) Use the diagram on the right to find the following:

- a)  $\sin A$     b)  $\cos A$     c)  $\tan A$   
d)  $\sin B$     e)  $\cos B$     f)  $\tan B$



- 2) Use the diagram on the right to find the following:

- a)  $\cos B$     b)  $\sec A$     c)  $\tan A$   
d)  $\csc B$     e)  $\cot A$     f)  $\sec B$



- 3) Use the Cofunction Theorem to fill in the blanks:

- a)  $\sin 35^\circ = \cos$  \_\_\_\_\_                      b)  $\tan 48^\circ = \cot$  \_\_\_\_\_  
c)  $\sec 64^\circ =$  \_\_\_\_\_  $26^\circ$

- 4) Evaluate to exact values when  $x = 30^\circ$ ,  $y = 45^\circ$ , and  $z = 60^\circ$ :

- a)  $-\cos(2x)$     b)  $5 \tan(90^\circ - y)$   
c)  $3 \csc(2z - 60^\circ)$

- 5) Convert to degrees and minutes:

- a)  $27.5^\circ$     b)  $102.85^\circ$

**More on the other side →**

6) Convert to decimal degrees – **approximate if necessary:**

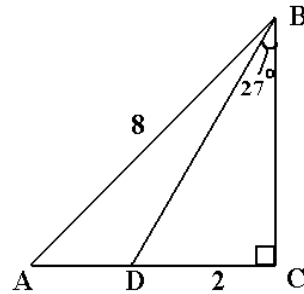
a)  $33^\circ 45'$

b)  $96^\circ 56'$

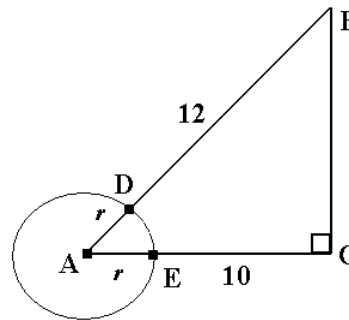
In 7) and 8), use the diagram on the right to find the following (the length of CD is 2) – **approximate the answer:**

7) Length of BC

8) Measure of A



9) In the diagram on the right, A is the center of the circle with radius  $r$ . If  $A = 28.1^\circ$ ,  $BD = 12$ , and  $CE = 10$ , find  $r$  (the radius of the circle) – **approximate the answer:**



**Approximate the answers for 10) – 15):**

10) A 16 foot ramp stretches from the ground up to the rear of a delivery truck. If the rear of the truck is 4 feet off the ground, find the angle of elevation between the ramp and the ground.

11) A 20 foot ladder is leaned up against a vertical building such that the angle of elevation with respect to the ground is  $25^\circ$ . How far up the building vertically will the ladder reach?

12) Two surveyors stand at the same height, but on opposite ends of a 1600-foot deep gorge. They need to estimate the width of the gorge. To do this, both surveyors pick the same large boulder at the very bottom of the gorge and then measure their angle of depression to the boulder. If one surveyor finds his angle of depression to the boulder to be  $38^\circ$  and the other surveyor finds her angle of depression to the boulder to be  $51^\circ$ , how wide is the gorge?

In 13) and 14), a boat leaves port on a course bearing  $S 41^\circ W$  and travels a distance of 107 miles when it stops:

13) How many miles due south has the ship travelled when it stops?

14) How many miles due west has the ship travelled when it stops?

15) A cruise ship leaves island A on a course bearing  $N 23^\circ E$  towards island B for a distance of 260 miles. The ship then leaves island B on a course bearing  $S 64^\circ E$  towards island C for a distance of 170 miles where it stops. Island C is located due east (on the same line as) island A. What is the distance from island A to island C? (**HINT: Angle B is NOT a right angle!**)