

1. In what 2 quadrants is:

a)  $\sin \theta > 0$  I, II

b)  $\cot \theta < 0$  II, IV

c)  $\sec \theta < 0$  II, III

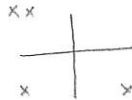
d)  $\cos \theta > 0$  I, IV

e)  $\tan \theta < 0$  II, IV

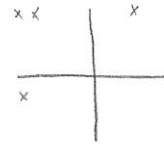
f)  $\csc \theta > 0$  I, II

2. In what quadrant would  $\theta$  be located in when:

a)  $\tan \theta < 0$  and  $\cos \theta < 0$   
II



b)  $\sin \theta > 0$  and  $\cos \theta < 0$   
II



c)  $\sec \theta < 0$  and  $\cot \theta > 0$   
III



d)  $\sin \theta < 0$  and  $\tan \theta < 0$   
IV



3. What is the radius of the unit circle?

1

4. Write the equation for the unit circle two different ways?

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

5. How do  $\cos \theta$  and  $\sin \theta$  relate to the ordered pairs on the unit circle?

$(x, y)$        $(\cos \theta, \sin \theta)$

6. Define  $\tan \theta$  in three different ways:

$\tan \theta = \frac{\text{opp}}{\text{adj}} = \frac{y}{x} = \frac{\sin \theta}{\cos \theta}$

7. What type of angle is a reference angle?

positive  
acute

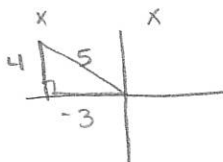
8. Describe how a reference triangle is constructed.

9. Name the multiples of the angles on the unit circle?

$30^\circ, 45^\circ$

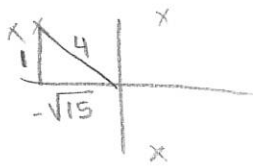
Evaluate without using a calculator.

10. Find  $\csc \theta$  and  $\cot \theta$  if  $\tan \theta = \frac{-4}{3}$  and  $\sin \theta > 0$



$\csc \theta = \frac{\text{hyp}}{\text{opp}} = \frac{5}{4}$        $\cot \theta = \frac{\cos \theta}{\sin \theta} = \frac{-3}{4}$

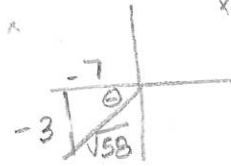
11. Find  $\cos \theta$  and  $\cot \theta$  if  $\sin \theta = \frac{1}{4}$  and  $\tan \theta < 0$



$$\cos \theta = -\frac{\sqrt{15}}{4}$$

$$\cot \theta = -\sqrt{15}$$

12. Find  $\sin \theta$  and  $\cos \theta$  if  $\cot \theta = \frac{3}{7}$  and  $\sec \theta < 0$



$$9+49$$

$$\sin \theta = -\frac{3}{\sqrt{58}}$$

$$\cos \theta = -\frac{7}{\sqrt{58}}$$

13. Point P is on the terminal side of  $\theta$ . Evaluate the six trig functions.  $P(-4, -3)$



$$\sin \theta = -\frac{3}{5}$$

$$\csc \theta = -\frac{5}{3}$$

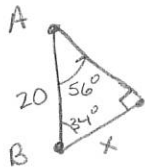
$$\cos \theta = -\frac{4}{5}$$

$$\sec \theta = -\frac{5}{4}$$

$$\tan \theta = \frac{3}{4}$$

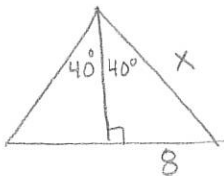
$$\cot \theta = \frac{4}{3}$$

14. Two towers are 20 miles apart, tower A being due North of tower B. A fire is spotted from the towers, and its bearing from tower A and tower B are  $S 56^\circ E$  and  $N 34^\circ E$ . How far is the fire from tower B?



$$\cos 34^\circ = \frac{x}{20}$$

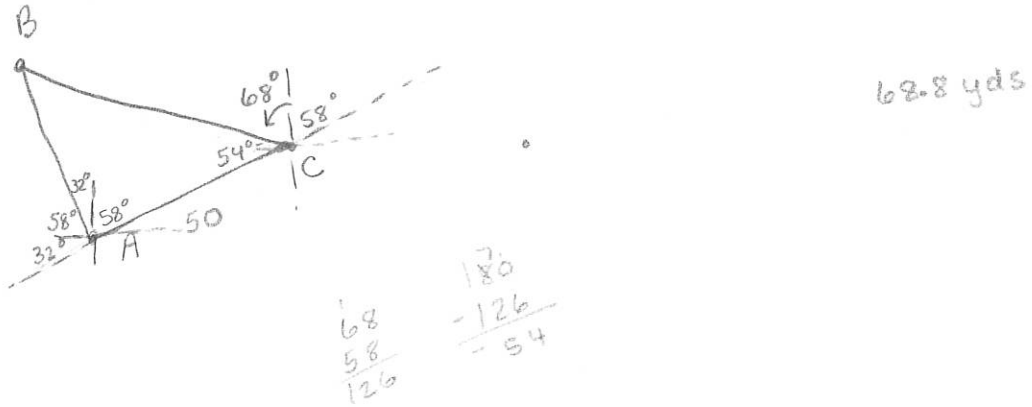
15. The base of an isosceles triangle is 16 cm in length and the angle opposite the base measures  $80^\circ$ . Find the length of the equal sides of the triangle.



$$\sin 40^\circ = \frac{8}{x}$$

$$x = \frac{8}{\sin 40^\circ}$$

16. A surveyor wishes to find the distance across a swamp. The bearing from one side of the swamp from point A to point B on the other side of the swamp is  $N 32^\circ W$ . The surveyor walks 50 yards from point A to another point C such that AB is perpendicular to AC. From point C, the bearing to point B is  $N 68^\circ W$ . Find the distance across the swamp. (From point A to point B)



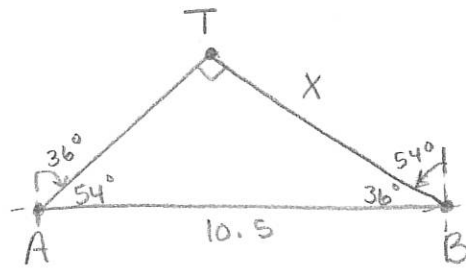
17. The bearing of a lighthouse from a ship 9.2 km away is  $32^\circ 30'$ . How far must the ship sail, due North, for the bearing of the lighthouse to be  $122^\circ 30'$ .



18. A sailboat travels 24 miles on a bearing of  $48^\circ$ , and then it turns and travels on a bearing of  $138^\circ$  for 22 miles. How far is the sailboat from its starting position?

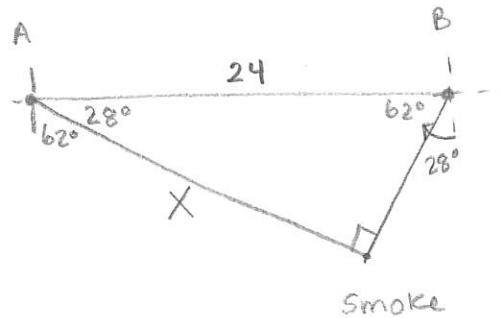


19. Radar stations are positioned 10.5 miles away from each other on an East-West line. A signal from a radio transmitter is found on a bearing N  $36^\circ$  E from station A and N  $54^\circ$  W from tower B. Find the distance from tower B to the radio transmitter.



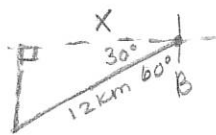
$$X = 8.5 \text{ miles}$$

20. Two forest ranger towers were located on an East-West line, 24 miles apart. Smoke was detected from tower B at a bearing of S  $28^\circ$  W. The same smoke was detected at a bearing of S  $62^\circ$  E from tower A. How far is the location of the smoke from tower A.



$$X = 21.2 \text{ miles}$$

21. A boat sails from a certain port in the direction S  $60^\circ$  W. After the boat has sailed 12 km, how far is it due west of port?



$$X = 10.4 \text{ km}$$