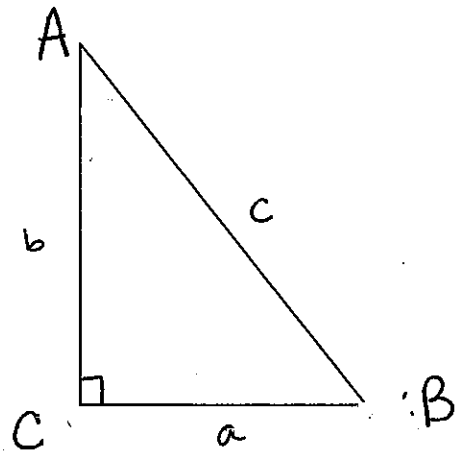
Name Key

Chapter 10 Review: Trigonometry

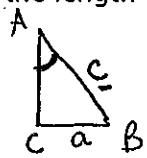
Use the triangle below for questions 1-4.



1) Find the following trig ratios. Leave your answers in fraction form.

- ☺ Sin A = $\frac{BC}{AB}$
- ☺ Cos A = AC/AB
- ☺ Tan A = BC/AC
- ☺ Sin B = AC/AB
- ☺ Cos B = BC/AB
- ☺ Tan B = AC/BC

2) Suppose you were given the measure of angle A and the length of side c. If you were asked to find the length of side a, which trig ratio would you use? Why?



Sin, because from angle A c is the hypotenuse and side a is the opposite side from angle A.

3) Suppose you were given the lengths of sides b and c, and you were asked to find the measure of angle A. How would you do this? Explain.

side b is adjacent to angle A and side c is hypotenuse, so use Cos.

4) How is the sine of angle A related to the cosine of angle B?

$\sin A = \cos B$

$\frac{BC}{AB} = \frac{BC}{AB}$

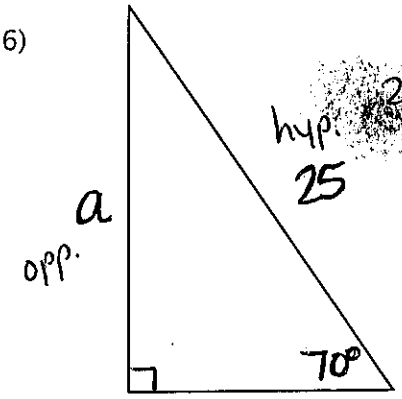
5) When looking at a trig problem, how do you tell the difference between using a regular trigonometric ratio or an inverse trigonometric ratio? Explain.

reg. trig = Solving for a side

inverse trig = Solving for angle

Find the missing side lengths and angle measurements in the triangles below. Show your work!

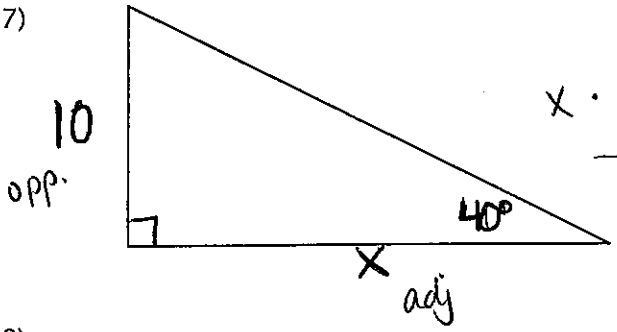
6)



$25 \cdot \sin 70 = \frac{a}{25} \cdot 25$

$a = 23.5$

7)

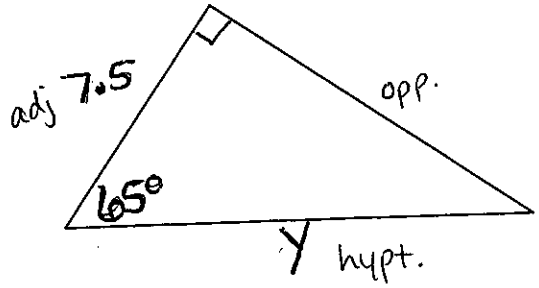


$x \cdot \tan 40 = \frac{10}{x} \cdot x$

$\frac{x \tan 40}{\tan 40} = \frac{10}{\tan 40}$

$x = 11.9$

8)

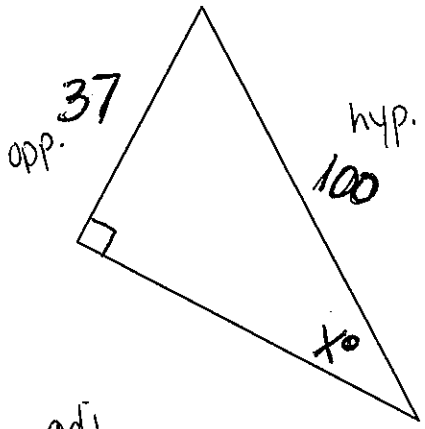


$Y \cdot \cos 65 = \frac{7.5}{Y} \cdot Y$

$\frac{Y \cos 65}{\cos 65} = \frac{7.5}{\cos 65}$

$Y = 17.7$

9)

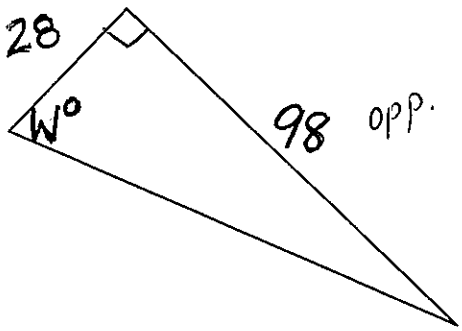


$\sin x = \frac{37}{100}$

$\sin^{-1}\left(\frac{37}{100}\right)$

$x = 21.7°$

10)



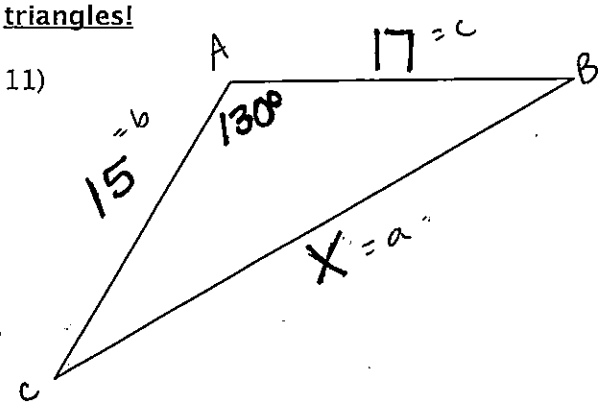
$\tan W = \frac{98}{28}$

$\tan^{-1}\left(\frac{98}{28}\right)$

$W = 74.1°$

Find the missing side lengths and angle measures below. Please notice that these are not right triangles!

11)



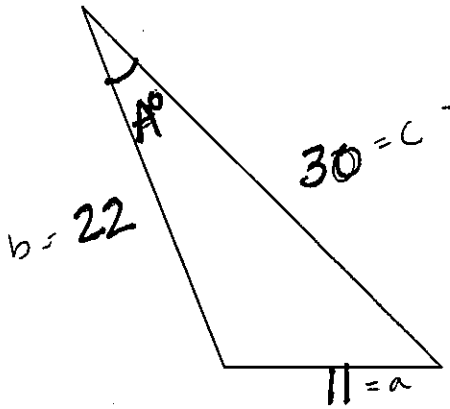
$a^2 = b^2 + c^2 - 2bc\cos A$

$X^2 = 15^2 + 17^2 - 2(15)(17)\cos 130$

$\sqrt{X^2} = \sqrt{841.8217}$

$\boxed{X = 29}$

12)



$11^2 = 22^2 + 30^2 - 2(22)(30)\cos A$

$121 = 1384 - 1320\cos A$

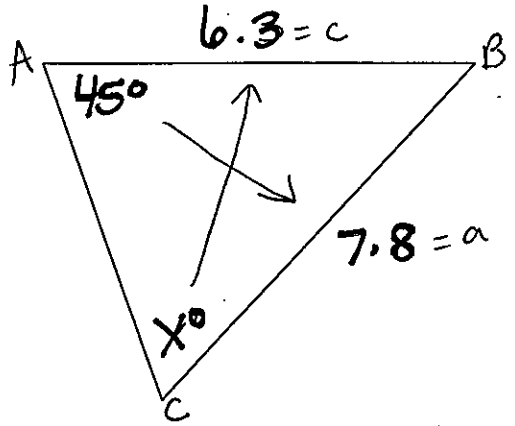
$-1384 \quad -1384$

$\frac{-1263}{-1320} = \frac{-1320\cos A}{-1320}$

$.9568 = \cos A$

$\cos^{-1}(.9568) = \boxed{16.9°}$

13)



$\frac{\sin X}{6.3} = \frac{\sin 45}{7.8}$

$\sin X = .5711$

$\sin^{-1}(.5711) = \boxed{34.8°}$

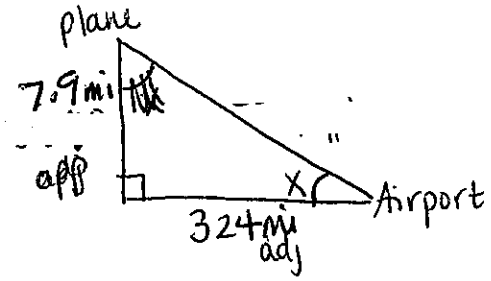
14) Give **exact** values for each of the following.

- ☺ Cos 150° → $-\sqrt{3}/2$
- ☺ Sin 240° → $-\sqrt{3}/2$
- ☺ Tan 270° → undefined
- ☺ Cos 585° → $-\sqrt{2}/2$
- ☺ Sin −135° → $-\sqrt{2}/2$
- ☺ Tan 315° → -1

Use a diagram to solve each of the following problems.

15)A plane flying at 42,000 feet is 324 miles away from the airport. In order to land at the airport appropriately, at what angle should the plane descend?

42,000 / 5280

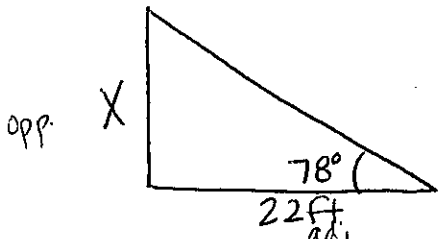


$\tan\theta = \frac{7.9}{324}$

$\tan^{-1}\left(\frac{7.9}{324}\right) = 1.4°$

$\tan^{-1}(.0244) = 1.4°$

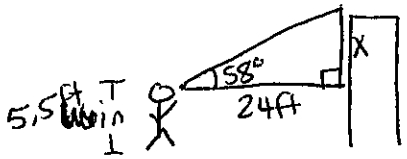
16)A flagpole casts a 22-ft shadow when the sun makes a 78° with the ground. How tall is the flagpole?



$\tan 78 = \frac{X}{22}$

$X = 103.5\text{ ft}$

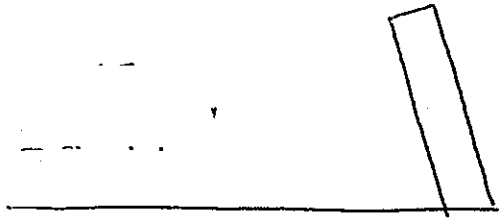
17)Miles, who is 5' 6" tall, stands 24 feet from the base of a building. He can see the top of the building at an angle of 58°. How tall is the building?



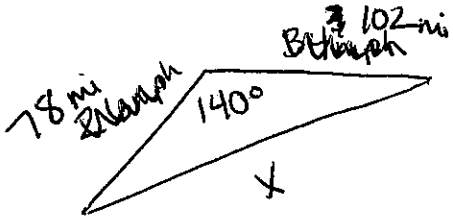
$\tan 58 = \frac{X}{24}$

$38.4 + 5.5 = 43.9\text{ ft}$

18)The leaning tower of Pisa was originally perpendicular to the ground. It is 179 feet tall. Because the foundation is slowly giving way, the tower now leans at an angle. A 6-foot-tall spectator stands 150 feet from the base of the tower and can see the top at an angle of 53°. At what angle does the tower now lean?



19)Two ships leave a harbor at the same time, traveling on courses that have an angle of 140° between them. If the first ship travels at 26 miles per hour and the second ship travels at 34 miles per hour, how far apart are the two ships after three hours?



$X^2 = 78^2 + 102^2 - 2(78)(102)\cos 140$

$\sqrt{X^2} = \sqrt{28677.299}$

$X = 169.3\text{ mi}$

20)Fill in the blank unit circle below, from memory! Degrees, radians, & exact values!