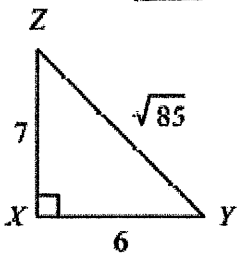**Right Triangle Trig Test Review #2**

Name: _Key_

1.

a)

Write the tangent ratios for $\angle Y$ and $\angle Z$.

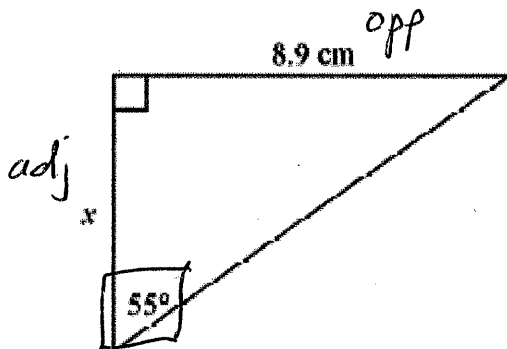$\tan Y = \boxed{7/6}$

$\tan Z = \boxed{\dfrac{6}{7}}$

b) Find the measures of $\angle Y$ and $\angle Z$

$Y = \tan^{-1}(7/6) = \boxed{49.399°}$

$Z = \tan^{-1}(6/7) = \boxed{40.601°}$

2. Find the value of x. Round your answer to the nearest thousandth. Include units!

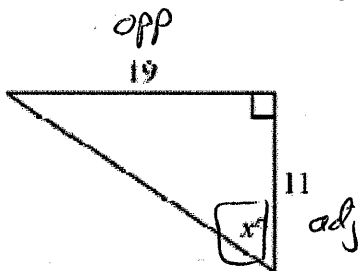$\dfrac{\tan 55}{1} = \dfrac{8.9}{x}$

$\dfrac{x}{1} = \dfrac{8.9}{\tan 55}$

$\boxed{x = 6.232 \text{ cm}}$

3. Find the value of x. Round your answer to the nearest thousandth.

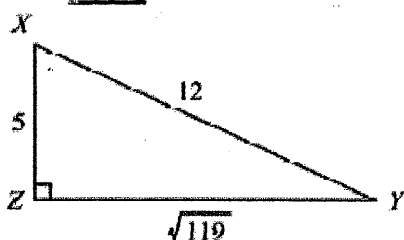$\tan X = \dfrac{19}{11}$

$X = \tan^{-1}\left(\dfrac{19}{11}\right) = \boxed{59.931°}$

4.

Write the ratios for $\sin X$ and $\cos X$.

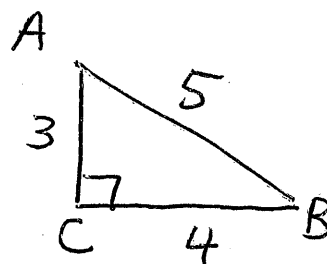$\sin X = \boxed{\dfrac{\sqrt{119}}{12}}$

$\cos X = \boxed{\dfrac{5}{12}}$

5. In right $\triangle ACB$, $AC = 3$, $BC = 4$, and $AB = 5$. Draw a figure.

A. Find the exact value of sin B. __$3/5$__

B. Find the exact value of cos A. __$3/5$__

C. Find the exact value of tan A. __$4/3$__

D. Find measurement of $\angle A$ (to the nearest degree). __$53.130°$__

$\cos A = 3/5$ $A = \cos^{-1}(3/5)$

$A = 53.130°$
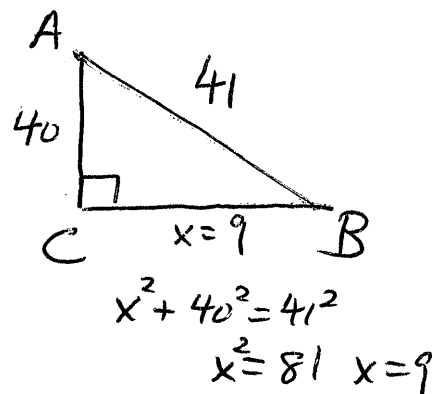
6. In right $\triangle ABC$, $\cos A = \frac{40}{41}$ and angle C is a right angle. Draw a figure.

A. Find the exact value of sin A. __$9/41$__

B. Find the exact value of cos B. __$9/41$__

C. Find the exact value of tan A. __$9/40$__

D. Find measurement of $\angle B$ (to the nearest degree). __$77.319°$__

$\cos B = 9/41$

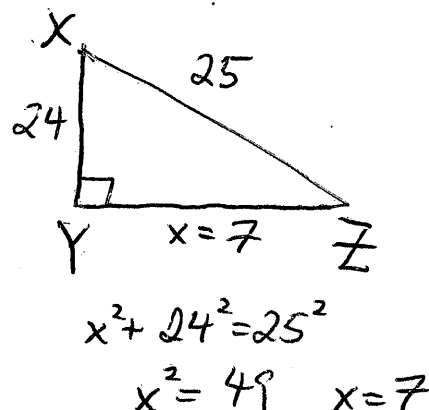$B = \cos^{-1}(9/41) = 77.319°$

$x^2 + 40^2 = 41^2$

$x^2 = 81$ $x = 9$

7. In right $\triangle XYZ$, $\sin Z = \frac{24}{25}$ and angle Y is a right angle. Draw a figure.

A. Find the exact value of sin X. __$7/25$__

B. Find the exact value of cos Z. __$7/25$__

C. Find the exact value of tan X. __$7/24$__

D. Find measurement of $\angle X$ (to the nearest degree). __$16.260°$__

$\tan X = 7/24$

$X = \tan^{-1}(7/24) = 16.260°$

$x^2 + 24^2 = 25^2$

$x^2 = 49$ $x = 7$

8. Find the value of w and then x. Round lengths to the nearest thousandth and angle measures to the nearest thousandth degree.
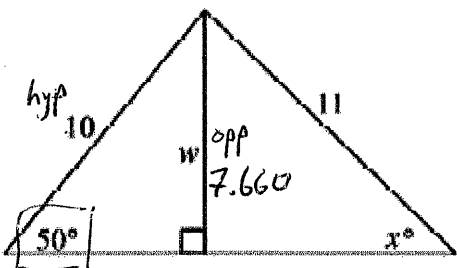
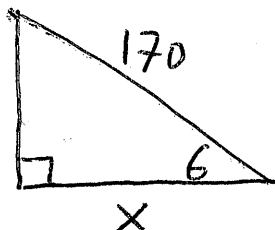a) $\dfrac{\sin 50}{1} = \dfrac{w}{10}$ $w = 10 \sin 50 = \boxed{7.660}$

b) $\sin X = \dfrac{7.660}{11}$

$X = \sin^{-1}\left(\dfrac{7.660}{11}\right) = \boxed{44.136°}$

9. Viola drives 170 meters up a hill that makes an angle of 6° with the horizontal. To the nearest thousandth of a meter, what horizontal distance has she covered?

$$\frac{\cos 6}{1} = \frac{x}{170}$$

$$x = 170 \cos 6 = \boxed{169.069 \text{ m}}$$

10. To approach the runway, a small plane must begin a 9° descent starting from a height of 1125 feet above the ground. To the nearest thousandth of a mile, how many miles from the runway is the airplane at the start of this approach?
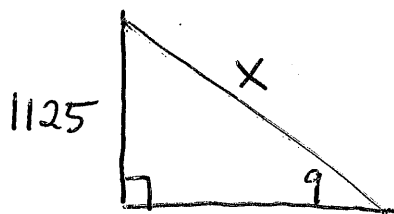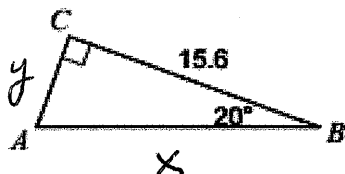
$$\frac{\sin 9}{1} = \frac{1125}{x}$$

$$\boxed{x = 7191.509 \text{ ft.}}$$

$$\frac{x}{1} = \frac{1125}{\sin 9}$$

11. Solve the following right triangle. Round decimals to the nearest thousandth

AB = 16.601

AC = 5.677

∠A = 70°

$$\frac{\cos 20}{1} = \frac{15.6}{x} \qquad \boxed{x = 16.601}$$

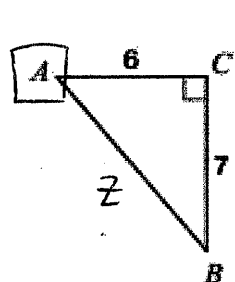$$\frac{x}{1} = \frac{15.6}{\cos 20} \qquad 15.6^2 + y^2 = x^2$$

$$15.6^2 + y^2 = 16.601^2 \qquad y^2 = 32.233$$

$$\boxed{y = 5.677}$$

12. Solve the following right triangle. Round decimals to the nearest thousandth

$$\tan A = \frac{7}{6}$$

$$A = \tan^{-1}\left(\frac{7}{6}\right) = 49.399°$$

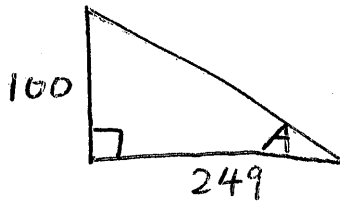∠A = 49.399°

∠B = 40.601°

AB = 9.219

$$6^2 + 7^2 = z^2$$

$$85 = z^2 \qquad \boxed{z = 9.219}$$

13.

A large totem pole in the state of Washington is 100 feet tall. At a particular time of day, the totem pole casts a 249-foot-long shadow. Find the measure of $\angle A$ to the nearest degree.
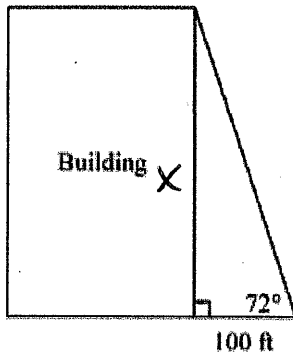
$$\tan A = \frac{100}{249}$$

$$A = \tan^{-1}\left(\frac{100}{249}\right) = \boxed{21.881°}$$

14.

The students in Mr. Collin's class used a surveyor's measuring device to find the angle from their location to the top of a building. They also measured their distance from the bottom of the building. The diagram shows the angle measure and the distance. To the nearest foot, find the height of the building.
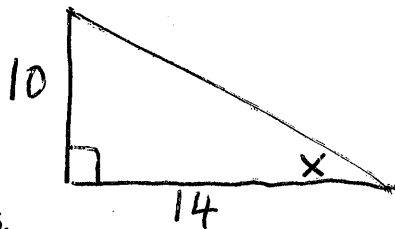
$$\frac{\tan 72}{1} = \frac{X}{100}$$

$$X = 100 \tan 72 = \boxed{307.768 \text{ ft.}}$$

15.

Find the angle of elevation of the sun from the ground to the top of a tree when a tree that is 10 yards tall casts a shadow 14 yards long. Round to the nearest degree.
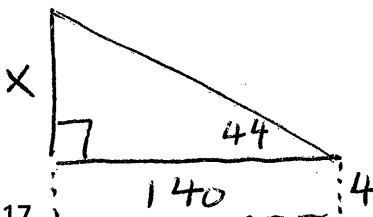
$$\tan X = \frac{10}{14}$$

$$X = \tan^{-1}\left(\frac{10}{14}\right) = \boxed{35.538°}$$

16.

To find the height of a pole, a surveyor moves 140 feet away from the base of the pole and then, with a transit 4 feet tall, measures the angle of elevation to the top of the pole to be 44°. To the nearest foot, what is the height of the pole?
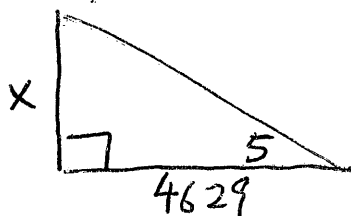
$$\frac{\tan 44}{1} = \frac{X}{140} \qquad X = 140 \tan 44 = 135.196$$

$$\text{pole height} = 135.196 + 4 \text{ ft} = \boxed{139.196 \text{ ft.}}$$

17.

An airplane pilot over the Pacific sights an atoll at an angle of depression of 5°. At this time, the horizontal distance from the airplane to the atoll is 4629 meters. What is the height of the plane to the nearest meter?

$$\frac{\tan 5}{1} = \frac{X}{4629}$$

$$X = 4629 \tan 5 = \boxed{404.985 \text{ m}}$$