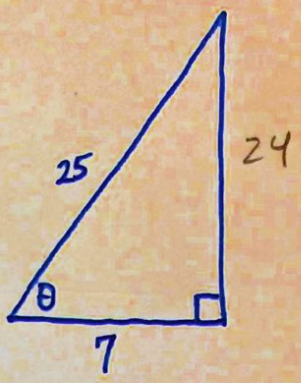
Precalculus Chapter 7 Practice Test

Name: Key

Complete each of the following problems. Show all work.

1. Find the exact six trig function values of θ in the following triangle:



$\sin\theta = \frac{24}{25}$ $\quad \csc\theta = \frac{25}{24}$

$\cos\theta = \frac{7}{25}$ $\quad \sec\theta = \frac{25}{7}$

$\tan\theta = \frac{24}{7}$ $\quad \cot\theta = \frac{7}{24}$

2. Solve the triangle with $b = 8$, $\alpha = 25°$, and $\gamma = 86°$. Find its area.

$\frac{\sin 69^\circ}{8} = \frac{\sin 25^\circ}{a}$

$\frac{\sin 69^\circ}{8} = \frac{\sin 86^\circ}{c}$

$\frac{1}{2}(3.62)(8)\sin 86^\circ$

$\beta = 69^\circ$

$a = 3.62$

$c = 8.55$

Area = 14.44

3. Solve the triangle with $a = 13$, $b = 15$, $\gamma = 93°$. Find its area.

$c^2 = 13^2 + 15^2 - 2 \cdot 13 \cdot 15 \cos 93^\circ$

$\cos\alpha = \frac{15^2 + 20.36^2 - 13^2}{2 \cdot 15 \cdot 20.36}$

$\frac{1}{2} \cdot 13 \cdot 15 \cdot \sin 93^\circ$

$c = 20.36$

$\alpha = 39.6^\circ$

$\beta = 47.4^\circ$

Area = 97.37

4. Solve the triangle with $a = 7.6$, $b = 9.7$, and $c = 11.1$. Find its area.

$\cos\gamma = \frac{7.6^2 + 9.7^2 - 11.1^2}{2 \cdot 7.6 \cdot 9.7}$

$\cos\beta = \frac{7.6^2 + 11.1^2 - 9.7^2}{2 \cdot 7.6 \cdot 11.1}$

$\frac{1}{2}(7.6)(9.7)\sin 78.8^\circ$

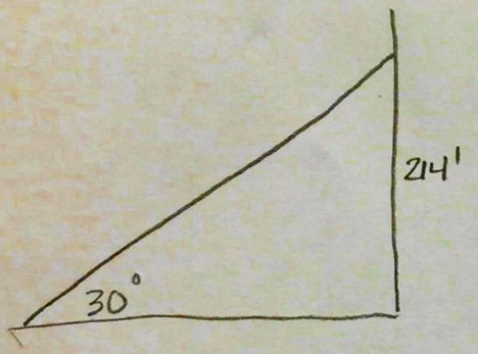
$\alpha = 42.2^\circ$

$\beta = 59.0^\circ$

$\gamma = 78.8^\circ$

Area = 36.16

5. A radio transmission tower is 220 feet tall. How long should a guy wire be if it is to be attached 6 feet from the top and is to make an angle of 30° with the ground? Give your answer to the nearest tenth of a foot.

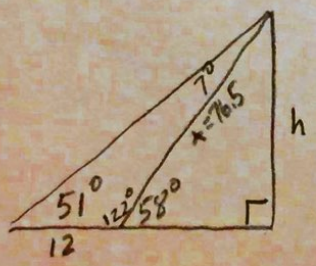


$\sin 30^\circ = \frac{214}{\ell}$

$\frac{1}{2} = \frac{214}{\ell}$

428 feet

6. A person stands away from a building, looking up to the top. The angle of elevation at ground level to the top of the building is 51°. The person then moves 12 feet closer to the building. At that time the angle of elevation at ground level to the top of the building is 58°. What is the height of the building? Round your answer to the nearest tenth of a foot.

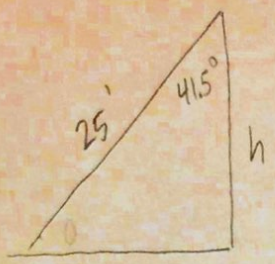


$\frac{\sin 7^\circ}{12} = \frac{\sin 51^\circ}{x}$

$\sin 58^\circ = \frac{h}{76.5}$

h = 64.9 ft

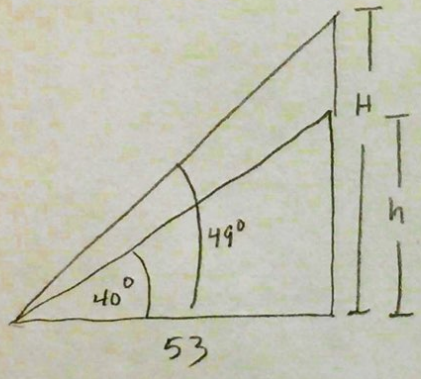
7. A twenty-five foot ladder just reaches the top of a house and forms an angle of 41.5° with the wall of the house. How tall is the house? Round your answer to the nearest tenth of a foot.



$\cos 41.5^\circ = \frac{h}{25}$

18.7 ft

8. A surveyor standing 53 meters from the base of a building measures the angle to the top of the building and finds it to be 40°. The surveyor then measures the angle to the top of the radio tower on the building and finds that it is 49°. How tall is the radio tower?



$\tan 40^\circ = \frac{h}{53}$ $\tan 49^\circ = \frac{H}{53}$

$h = 44.5$ $H = 61.0$

16.5 m

9. John and Barbara have a weird triangular room in their house. Its sides measure 12 ft., 15 ft., and 17 ft. Carpet costs $12 per square yard. How much would it cost to carpet this room?

$s = \frac{1}{2}(12+15+17)$

$s = 22$

$A = \sqrt{22(10)(7)(5)}$

$A = 87.75\ ft^2 \div 9 = 9.75\ yd^2$

So you need to buy 10 yd^2

So $120