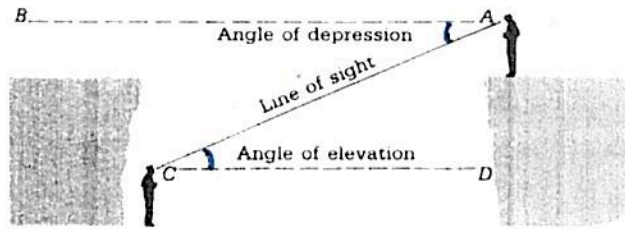


PAP Geometry
Unit 9 Test Review
 Trigonometry

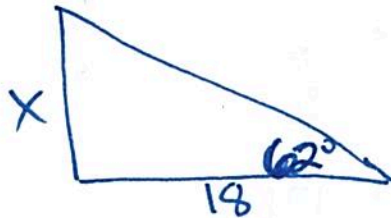
Name Key

Reminders:

Angle of Depression is equal to
 Angle of Elevation



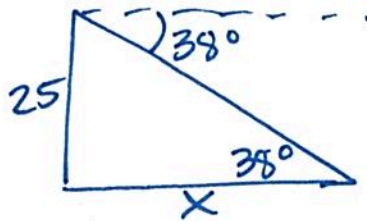
1. When the angle of elevation of the sun is 62° , a building casts a shadow 18 m long. How tall is the building?



$$\tan 62 = \frac{x}{18}$$

$$x = 33.853$$

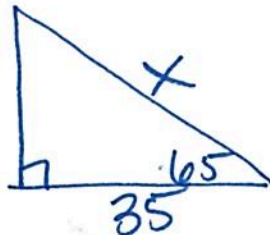
2. The angle of depression from the top of a tower to a boulder on the ground is 38° . If the tower is 25 m high, how far from the base of the tower is the boulder?



$$\tan 38 = \frac{25}{x}$$

$$x = 31.999$$

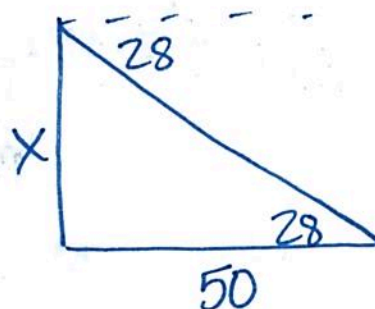
3. A guy wire is attached from the top of a tower to a point on the ground. The base of the tower is 35 m from the end of the wire on the ground. If the wire makes a 65° angle with the ground, how long is the wire?



$$\cos 65 = \frac{35}{x}$$

$$x = 82.817$$

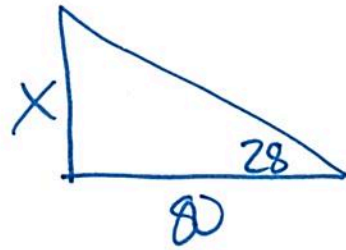
4. An observer at the top of a building sees a car on the road below. The angle of depression to the car is 28° . If the car is about 50 m from the building when it is seen, how tall is the building?



$$\tan 28 = \frac{x}{50}$$

$$x = 26.585$$

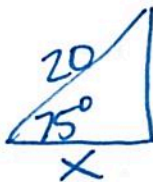
5. From a point 80 m from the base of a tower, the angle of elevation to the top of a tower is 28° . How tall is the tower?



$$\tan 28 = \frac{X}{80}$$

$$X = 42.537$$

6. A ladder that is 20 ft. long is leaning against the side of a building. If the angle formed between the ladder and ground is 75° , how far is the bottom of the ladder from the base of the building? If you lean a 10 foot ladder at the same angle, how far up the building will it reach?



$$\cos 75 = \frac{X}{20}$$

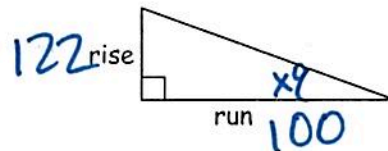
$$X = 5.176$$



$$\sin 75 = \frac{X}{10}$$

$$X = 9.659$$

7. The grade of a road is the ratio $\frac{\text{rise}}{\text{run}}$, usually expressed as a percent. For example, a railway with a grade of 5% rises 5 ft. for every 100 ft. of horizontal distance. The world's steepest railway is the Katoomba Scenic Railway in the Blue Mountains of Australia. It has a grade of 122%. At what angle does this railway go up?



$$\tan^{-1}\left(\frac{122}{100}\right)$$

$$51^\circ \quad 50.659$$

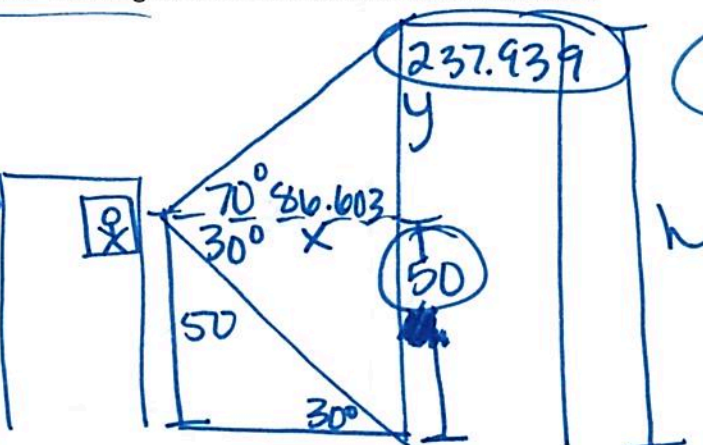
8. A person at a window, 50 feet above the street sights points on the building directly across the street. If the angle of elevation to the top of the building is 70° , while the angle of depression to sight the bottom of the building is 30° , find the height of the building to the nearest thousandth of a foot.

$$\tan 30 = \frac{50}{X}$$

$$X = 86.603$$

$$\tan 70 = \frac{y}{86.603}$$

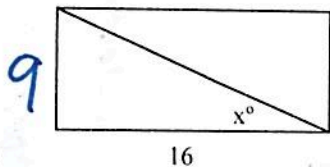
$$y = 237.939$$



$$237.939$$

$$287.939$$

9. If the area of the rectangle is 144 ft^2 , find the measure of the angle x .



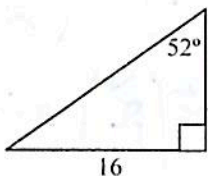
$$\frac{144}{16}$$

$$\tan^{-1}\left(\frac{9}{16}\right)$$

$$x = 29^\circ$$

10. Find the area of the triangle:

$$A = 100.008$$



$$\tan 52 = \frac{16}{h}$$

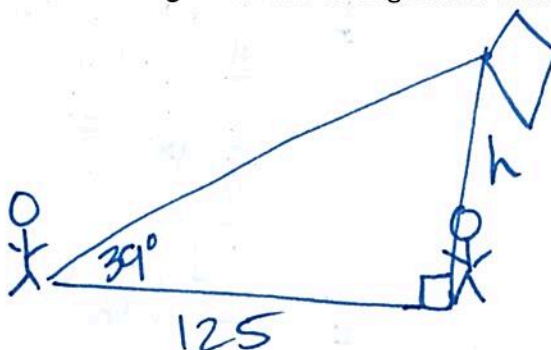
$$A = \frac{1}{2}(16)(12.501)$$

$$A = 100.008$$

11. Ms. Worthington is flying a kite directly over her friend, Cathy, who is 125 meters away. When she holds the kite string down to the ground, the string makes a 39° angle with the level ground. How high is Ms. Worthington's kite?

$$\tan 39 = \frac{h}{125}$$

$$101.223$$



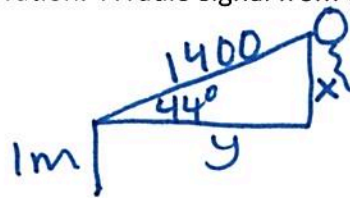
12. Meteorologist Stormy Grey uses a clinometer (an angle-measuring device) on a 1-meter-tall tripod to find the height of a weather balloon. She views the balloon at a 44° angle of elevation. A radio signal from the balloon tells her that it is 1400 meters from her clinometers.

a. How high is the balloon?

$$\sin 44 = \frac{x}{1400}$$

$$x = 972.522$$

$$973.522$$



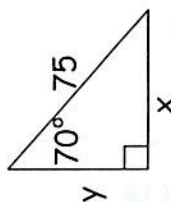
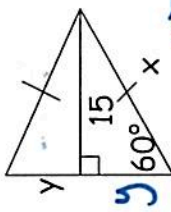
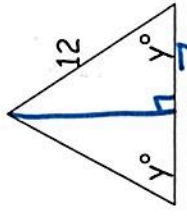
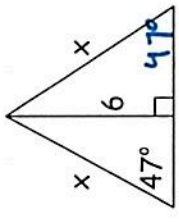
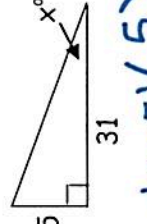
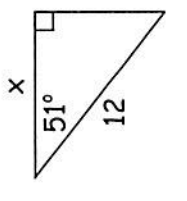
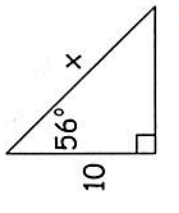
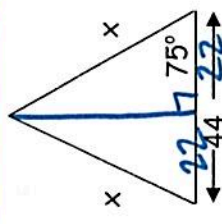
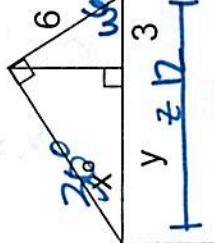
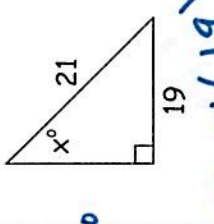
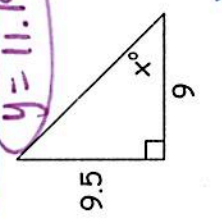
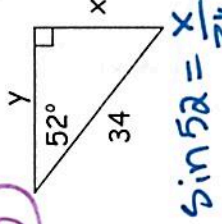
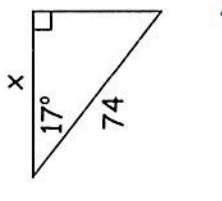
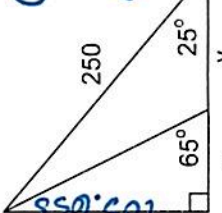
b. How far is she from the point directly below the balloon?

$$\cos 44 = \frac{y}{1400}$$

$$y = 1,007.076$$

Trig Review Practice

Solve for x and/or y in each problem. Round sides to the thousandths and angles to the nearest whole degree.

1	 $\sin 70 = \frac{x}{75}$ $x = 70.477$ $\cos 70 = \frac{y}{75}$ $y = 25.652$	 $\sin 60 = \frac{15}{x}$ $x = 17.321$ $\tan 60 = \frac{15}{y}$ $y = 8.660$	 $\cos^{-1}\left(\frac{7}{12}\right)$ $y = 54^\circ$	 $\sin 47 = \frac{6}{x}$ $x = 8.204$ $\tan 47 = \frac{6}{y}$ $y = 12.884$	 $\tan^{-1}\left(\frac{5}{31}\right)$ 9°	 $\cos 51 = \frac{x}{12}$ $x = 7.552$	 $\cos 56 = \frac{10}{x}$ $x = 17.883$
2	 $\cos 75 = \frac{22}{x}$ $x = 85.001$	 $\cos^{-1}\left(\frac{3}{6}\right) = 60$ $x = 30^\circ$ $\sin 30 = \frac{6}{z}$ $z = 9$	 $\sin^{-1}\left(\frac{19}{21}\right)$ $x = 65^\circ$	 $\sin 52 = \frac{34}{x}$ $x = 26.792$ $\cos 52 = \frac{y}{34}$ $y = 20.932$	 $\cos 17 = \frac{x}{74}$ $x = 70.767$	 $\tan 65 = \frac{105.655}{x}$ $x = 149.208$ $y = 177.309$	 $\cos 25 = \frac{205}{226.577}$ $\sin 25 = \frac{y}{226.577}$