Basic Trig Applications

The Weight Room

1. The perimeter of an equilateral triangle is 93 cm. What is the height of the triangle?

2. If you begin at (0, 7) on the coordinate plane and then walk 12 units at an angle of 25° relative to the line $y = 7$, what are the two possible coordinates for your new location?

3. If you sail 8.4 miles at a compass heading of 75°, how far north and how far east will you be from your original position?

4. If the sun casts a 70-ft shadow of a flagpole when the sun's angle of inclination (the angle measured relative to the ground) is 40°, how long will the shadow be when the angle of inclination drops to 32°?

5. If you walk up a 20° slope to the top of a 320-ft hill, how far will you have walked?

6. A wheelchair ramp is to be built with an angle of elevation of 7.5°. If it needs to reach a point that is 32 in. higher than its starting point., how long will the ramp be?

7. A 20-ft ladder needs to reach a point that is 18 ft up a wall. What will the angle of the ladder be relative to the ground?

8. The base of a parallelogram is 40 cm. The two adjacent sides are each 20 cm. If the height of the parallelogram is 19.32 cm, what are the measures of the internal angles of the parallelogram?

9. If the height of an isosceles triangle (measured to the side that is not congruent to the other two) is twice the length of the base, what are the measures of the two congruent base angles?

10. What is the length of the longest diagonal that can be drawn in a regular octagon that has a perimeter of 80 cm?

11. The two 20-cm diagonals of a rectangle intersect at an angle of 140°. What are the dimensions of the rectangle?

12. The hypotenuse of a right triangle measures 10 mm. If one of the angles of the triangle measures 70°, what is the area of the triangle?

13. The radii of the circles are 8 cm, 8 cm, and 5 cm. (a) Find $m\angle ABC$. (b) If the larger radius is 8 cm, what would the smaller radius have to be so that $m\angle ABC = 30°$?