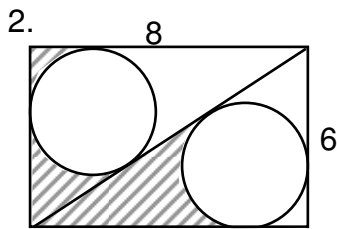
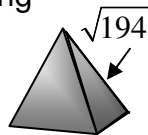


1. A triangle has interior angles with measures $(4x)^\circ$, $(3x+10)^\circ$ and $(120-2x)^\circ$. Give the measure of the largest interior angle of the triangle.



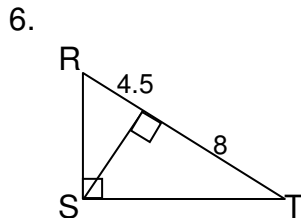
2. A rectangle with dimensions 6 by 8 has one diagonal drawn and two circles inscribed as shown. Find the total area of the shaded regions (to the left of each circle, inside the rectangle).

3. Give the volume of a right square pyramid with base area 100 and each lateral edge having length $\sqrt{194}$.



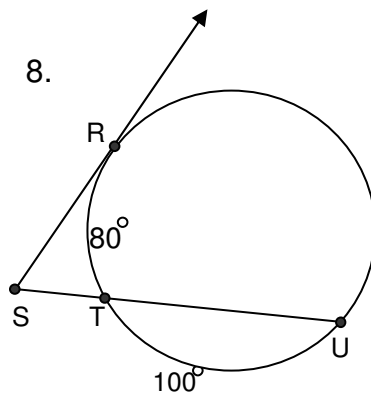
4. A regular polygon with 180 sides has what degree measure for one exterior angle?

5. An isosceles triangle has each of two legs 15 cm. If the height to the base is 9 cm, find the perimeter of the triangle, in cm.



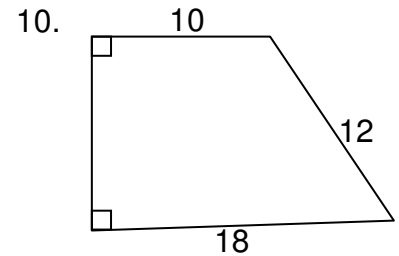
6. The altitude to the hypotenuse of a right triangle RST divides the hypotenuse (RT) into segments of lengths 4.5 and 8 as shown. Give the length of \overline{ST} .

7. A regular hexagon has each side of length 12. Give the length of the longest diagonal of the hexagon.



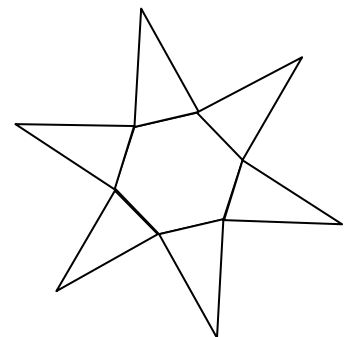
8. R, T and U are on the circle shown. S, T and U are collinear. If arc TU is 100 degrees, and arc RT is 80 degrees, find the degree measure of angle S.

9. A triangle has positive side lengths of $(x+2)$, $(2x-2)$ and $(x-2)$. If x is an integer from 1 to 9, inclusive, find the number of possible values of x .



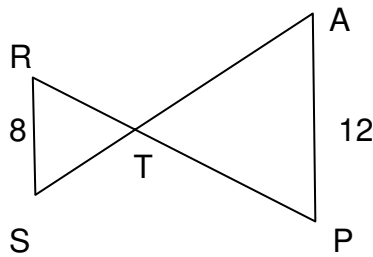
10. A trapezoid has two right angles as shown, and base lengths 10 and 18. If one leg is 12, and the acute angle of the trapezoid is on the larger base as shown, find the height (fourth side) of the trapezoid.

11.



A right pyramid has a regular hexagon base and congruent lateral faces. If the surface area of the pyramid is $480+96\sqrt{3}$ and base edges are each 8, then give the height of the pyramid.

12.



$\overline{RS} \parallel \overline{AP}$. $ST = x + 1$.
 $TP = 2x$. $TA = 2x - 1$.
 Give the perimeter of $\triangle TAP$.

13.

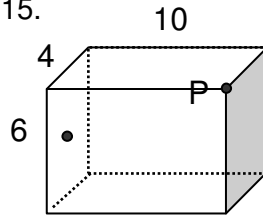
In a circle of radius 12, a chord has length $12\sqrt{3}$. What is the area of the smaller of the two regions bounded by the chord and the circle?

14.



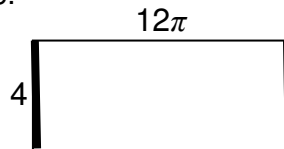
A solid hemisphere (semi-sphere) has total surface area $\frac{27}{4}\pi \text{ cm}^2$.
 Find the volume of the hemisphere in cm^3 .

15.



A room is a right rectangular prism. The ceiling is 4' by 10'. The height of the room is 6'. A bug is in the center of one 4x6 wall and will crawl on the walls and/or ceiling or floor, to the opposite corner of the ceiling (P). What is the minimum distance that he will crawl in feet?

16.



A rectangular piece of plastic has dimensions 4 and 12π . The two short sides are brought together, and a right circular cylinder with height 4 is made. Find the volume of the resultant cylinder.

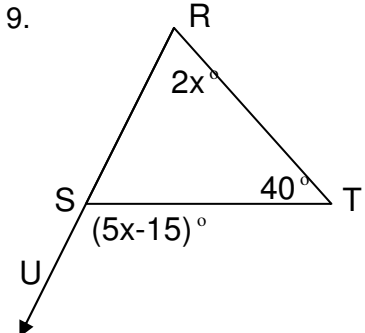
17.

If $\sin(x) = \frac{1}{4}$ in a right triangle with acute angle measure x , find the reciprocal of $\tan(x)$.

18.

An isosceles triangle ABC has $AB = BC$. If the measure of angle A is 40 degrees, and the measure of angle B is $(2x - 4)$ degrees, then find the value of x .

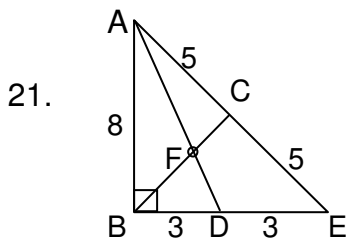
19.



In $\triangle RST$,
 $m\angle R = 2x^\circ$, $m\angle T = 40^\circ$
 and exterior angle TSU has measure $(5x - 15)^\circ$.
 Give the degree measure of angle SRT in fraction form.

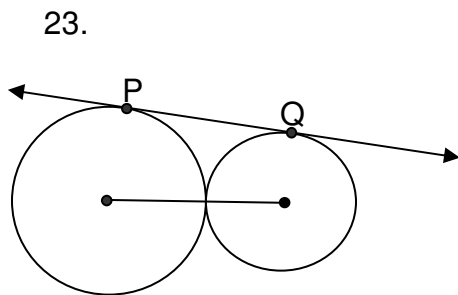
20.

A regular polygon has a sum of interior angles that is 1800 degrees. Find the number of sides of this polygon.



In right $\triangle ABE$, $AB=8$. $BE=6$. C and D are midpoints of two sides as shown. \overline{AD} intersects \overline{BC} at F . Find AF in fraction form.

22.
The complement of the angle A is half of the measure of A . Find the measure of the supplement of angle A .



Two circles are externally tangent as shown, and a tangent line has points of tangency P and Q to the respective circles. If the radii are 3 and 4, then find PQ .

24.
 $\triangle RST$ is obtuse. $RS=6$ and $ST=6$. What is the least possible integer value for RT ?

25.
A triangle has angle measures 30, 60 and 90 degrees. The perimeter of the triangle is $3 + \sqrt{3}$. What is the length of the hypotenuse of the triangle?