A regular polygon has 54 total diagonals. What is the degree measure of one of its interior angles?

Answer: ______________

Round 1 2 3 4 5

Answer: ______________

Round 1 2 3 4 5
A geometric solid is formed by using only 4 triangles, 4 rectangles, and 4 pentagons. How many vertices will this solid have?

Answer: ________________

Round 1 2 3 4 5
The base of an isosceles triangle has length 2 and lies on the line \( y = x + 4 \). If the legs intersect at the origin, what is the perimeter of the triangle?

Answer: ______________

Round 1 2 3 4 5
The radius of a particular bicycle tire is $\frac{3}{\pi}$ feet.
How many revolutions will this tire make in a ride that is exactly one mile in length?

Answer: ____________

Round 1 2 3 4 5

Answer: ____________

Round 1 2 3 4 5
How many non-congruent right triangles have integer side lengths and a hypotenuse whose length is less than or equal to 30?

Answer: ________________

Round 1 2 3 4 5

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How many non-congruent right triangles have integer side lengths and a hypotenuse whose length is less than or equal to 30?

Answer: ________________

Round 1 2 3 4 5
Find the value of $x$ in the diagram below.

Answer: ____________________

Round 1 2 3 4 5
What is the volume of a cone with diameter 20 and a slant height of 26?

Answer: ________________________

Round 1 2 3 4 5

What is the volume of a cone with diameter 20 and a slant height of 26?

Answer: ________________________

Round 1 2 3 4 5
Four racquet balls of radius 1 inch are stacked on a table so that each of them is tangent to the 3 others, and 3 of the balls are tangent to the surface of the table. What is the maximum distance that a point on the surface of one of the balls can be from the surface of the table?

Answer: ________________

Round 1 2 3 4 5
Find the value of $x$ in the following diagram:

Answer: ________________

Round  1  2  3  4  5

Find the value of $x$ in the following diagram:

Answer: ________________

Round  1  2  3  4  5
A right triangle has two sides of length \( \sqrt{842} \) and \( \sqrt{58} \). What is the sum of the two possible lengths for the third side?

Answer: ________________________

Round 1 2 3 4 5

A right triangle has two sides of length \( \sqrt{842} \) and \( \sqrt{58} \). What is the sum of the two possible lengths for the third side?

Answer: ________________________

Round 1 2 3 4 5
If two triangles are similar, what is the greatest number of pairs of corresponding parts (sides and angles) that can be congruent without the triangles themselves being congruent?

Answer: ________________
Round  1  2  3  4  5

Answer: ________________
Round  1  2  3  4  5
A regular octagon is inscribed in a circle of radius 4. What is the area enclosed by the octagon?

Answer: ________________

Round 1 2 3 4 5

A regular octagon is inscribed in a circle of radius 4. What is the area enclosed by the octagon?

Answer: ________________

Round 1 2 3 4 5
$\triangle ABC \cong \triangle DEF$. If $m\angle A = 4x + 13$, $m\angle B = 36$, and $m\angle F = 5x + 5$. What is $m\angle D$, in degrees? All numbers are in degrees.

Answer: ____________________  
Round 1 2 3 4 5

Answer: ____________________  
Round 1 2 3 4 5
The altitude drawn to the hypotenuse of a right triangle divides the hypotenuse into segments of length 10 and 12. What is the area of this right triangle?

Answer: ________________

Round 1 2 3 4 5
Two distinct circles are given by the equations:

\[(x + 7)^2 + (y - 5)^2 = 36\]
\[(x - 4)^2 + (y + 1)^2 = 16.\]

If A is a point on the first circle and B is a point on the second circle, what is the sum of the greatest and smallest possible values for the length of \(AB\)?

Answer: ________________________

Round 1 2 3 4 5

Answer: ________________________

Round 1 2 3 4 5
A kite has one diagonal which is divided by the other diagonal into segments of length 5 and 16. If the area of the kite is 252, what is its perimeter?
Quadrilateral ABCD is inscribed in circle P. The radius of circle P is 5 in., $\angle A = 10x + 2$, $\angle B = 8x + 3$, $\angle C = 68$ and $\angle D = 6x + 23$, where all measures are in degrees. Find the positive difference between the degree measures of arc AB and arc CD.

Answer: ________________

Round 1 2 3 4 5
A right rectangular prism has faces with areas of 35 and 56. If the volume of the solid is 280, what is the surface area of this prism?

Answer: ________________________

Round  1  2  3  4  5
A 45°-45°-90° triangle and 30°-60°-90° triangle share a hypotenuse. What is the ratio of the larger triangle area to the smaller triangle area?

Answer: ________________

Round  1  2  3  4  5

A 45°-45°-90° triangle and 30°-60°-90° triangle share a hypotenuse. What is the ratio of the larger triangle area to the smaller triangle area?

Answer: ________________

Round  1  2  3  4  5
An isosceles trapezoid has three sides of length 10 and one side of length 22. If this trapezoid is inscribed in a circle, how far is the center of the circle from the longer base?

Answer: ________________

Round  1  2  3  4  5

An isosceles trapezoid has three sides of length 10 and one side of length 22. If this trapezoid is inscribed in a circle, how far is the center of the circle from the longer base?

Answer: ________________

Round  1  2  3  4  5
A regular hexagon has side length 10. What is the enclosed area of the largest equilateral triangle which will fit inside this hexagon?

Answer: ________________

Round 1 2 3 4 5
The supplement of an angle is 20 degrees less than three times the complement of the angle. Find the sum, in degrees, of the complement and the supplement of this angle.

Answer: ________________

Round 1 2 3 4 5

Answer: ________________

Round 1 2 3 4 5
Ali runs around a \(\frac{1}{4}\)-mile track at a constant rate of 2 minutes per lap. Benson runs the same track at a constant rate of 3.5 minutes per lap. How many seconds will it take Ali to catch Benson from behind (or “lap him”) if they both start at the same place at the same time and run the same direction?

Answer: ______________

Round 1 2 3 4 5

Answer: ______________

Round 1 2 3 4 5
What is the length of the altitude drawn to the longest side of a triangle whose sides are length 7, 8, and 9?

Answer: ________________________

Round 1 2 3 4 5

What is the length of the altitude drawn to the longest side of a triangle whose sides are length 7, 8, and 9?

Answer: ________________________

Round 1 2 3 4 5
The surface area of a cone is $200\pi$. If the sum of the radius and slant height is 25, what is the ratio of the lateral area to the base area?

Answer: ________________

Round 1 2 3 4 5