

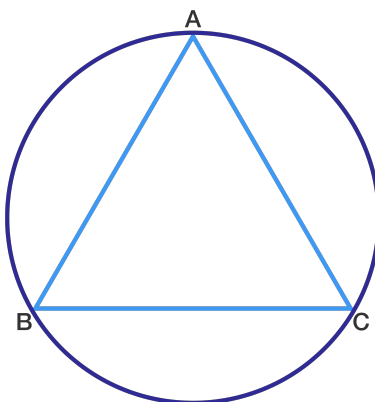
Think It Through

February 8, 2023

1. If the angles of a triangle are in the ratio 4:1:1. What is the ratio of the longest side to the perimeter?

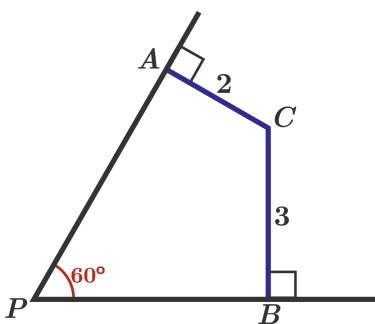
Solution: $\sqrt{3} : (2 + \sqrt{3})$

2. In the figure $\triangle ABC$ is an equilateral triangle where $AB = 6$ cm. The area of the circumcircle is $k\pi$ cm². Find the value of k .



Solution: 12

3. Find PC



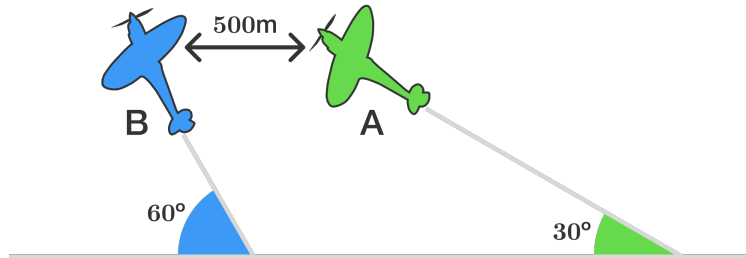
Solution: 79

4. Triangle ABC has area equal to $\frac{90\sqrt{3}}{4}$ and perimeter equal to 30. Also, one of its angles is equal to 60° . What is the product of the sides of ABC .

Solution: 945

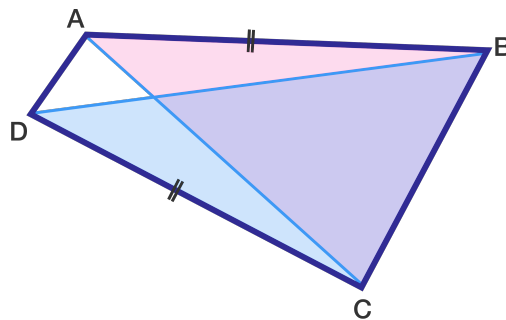
5. Aeroplanes A and B are flying with constant speed in the same vertical plane at angles 30° and 60° with respect to the horizontal, respectively, as shown in the figure. The airspeed of A is $100\sqrt{3}$ meters per second. Initially, an observer in A sees B directly ahead and at the same altitude at a (horizontal) distance of 500 m.

Assuming they take no evasive action and collide, after how many seconds does this happen?



Solution: 5

6. Quadrilateral $ABCD$ has $AB = CD$, and the acute angles B and C satisfy $\sin B = \frac{4}{9}$ and $\sin C = \frac{5}{6}$. Find the ratio between the area of $\triangle ABC$ to the area of $\triangle BDC$. Give your answer to 3 decimal places.



Solution: $\frac{8}{15}$