

April 26<sup>th</sup>

An equilateral triangle and a square have the same perimeter.

The area of the triangle is  $9\sqrt{3}$  cm<sup>2</sup>.

Find the length of the diagonal of the square.

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Area of a triangle =  $\frac{1}{2} ab \sin C$

But since it's equilateral  $9\sqrt{3} = \frac{1}{2} \times l \times l \times \sin 60$

Hence  $l^2 \times \frac{\sqrt{3}}{2} = 18\sqrt{3}$

Which gives  $l = 6\text{cm}$

Perimeter of triangle  $= 18\text{cm}$

Therefore side of square  $= 4.5\text{cm}$

Diagonal of square  $= \sqrt{4.5^2 + 4.5^2}$

$$= \frac{9\sqrt{2}}{2} \text{ cm}$$