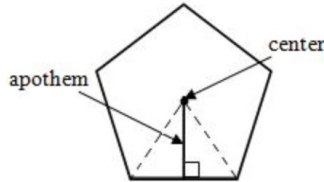


# Area of a Regular Polygon

## Vocabulary

**Apothem:** the distance from the center of a regular polygon to the midpoint of a side.



## Formula

$$P = S \times n$$

$$A = \frac{s \times a \times n}{2} \quad \text{where } s \text{ is the side length, } a \text{ is the apothem, and } n \text{ is the number of sides}$$

$$A = \frac{P \times a}{2}$$

### Example 1

Find the area of a pentagon with a side length of 6 cm and an apothem of 4 cm.



$n=5$  ① Rule  $A = \frac{san}{2}$  Always write the rule!

②  $A = \frac{6(4)(5)}{2}$

③  $A = \frac{120}{2}$

④  $A = 60 \text{ cm}^2$

### Example 2

What is the length of the side of a regular hexagon with an area of  $48 \text{ cm}^2$  and an apothem of 8 cm?

①  $A = \frac{san}{2}$

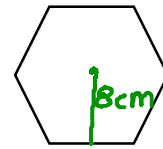
②  $(48) = \frac{s(8)(6)}{2}$

③  $96 = s(8)(6)$

$96 = 48s$

$\frac{96}{48} = \frac{48s}{48}$

$2 = s$



$S = 2 \text{ cm}$