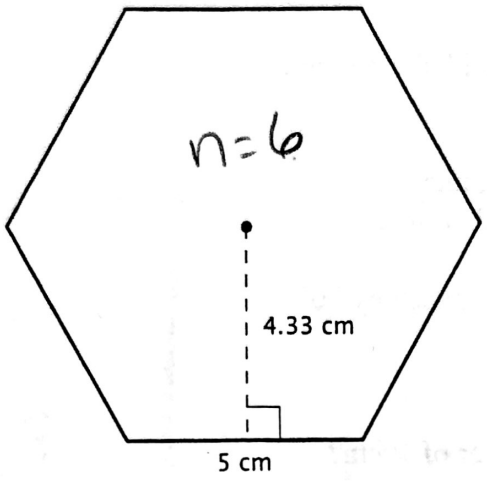
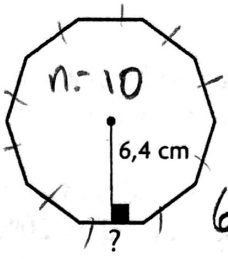
1. Calculate the area

a)



Area: $= \frac{S.a.n}{2} = \frac{5 \times 4.33 \times 6}{2} = 64.95_{cm2}$

b) The area of the regular polygon is 66.56 cm².



$A = \frac{S.a.n}{2}$

$66.56 = \frac{S(6.4)(10)}{2}$

$66.56 = S(32)$

$\frac{66.56}{32} = S$

$2.08_{cm} = S$

Answer:

2) Find the length of the apothem for a regular pentagon with 4 cm sides and an area of 27.5 cm².

n=5

$A = \frac{S.a.n}{2}$

$27.5 = \frac{4(a)5}{2}$

$27.5 = 10(a)$

$\frac{27.5}{10} = a$

2.75 cm

3) A regular polygon with 5 cm sides and an apothem of 6.04 cm has an area of 120.8 cm². Which regular polygon is it?

$A = \frac{S.a.n}{2}$

$120.8 = \frac{5(6.04)n}{2}$

$120.8 = 15.1n$

$\frac{120.8}{15.1} = n$

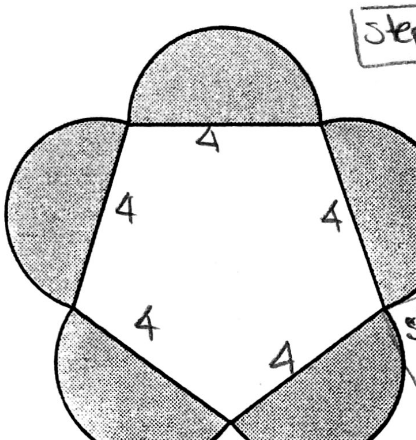
$8 = n$

octagon

4) Complete the following table.

Name of the regular polygon	Number of sides (n)	Measure of one side (cm) (S)	Measure of the apothem (cm) (a)	Perimeter of the polygon (cm) n(S)	Area of the polygon (cm²) (n.a.S)/2
Pentagon	5	6	4.1	30	61.5
Octagon	8	9	10.9	72	392.4
heptagon	7	8	8.3	56	232.4
Hendecagon	11	4	6.8	44	149.6

(5) Semi-circles are constructed on each side of a regular pentagon. The perimeter of the pentagon is 20 cm. What is the area of the shaded sections?



Step 1: $P = sn$

$20 = s(5)$

$\frac{20}{5} = s$

$4 = s$

Step 2: Area of half circle is

diameter = 4, radius = 2

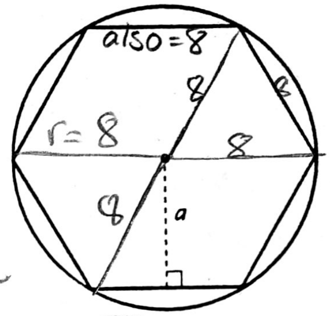
$= \frac{\pi r^2}{2} = \frac{\pi (2)^2}{2} = 6.28\ cm^2$

Step 3: 5 half circle

$5 \times 6.28\ cm^2$

$31.4\ cm^2$

(6) A hexagon is inscribed in a circle. If the radius of the circle is 8 cm, and the area of the hexagon is 166.32 cm², determine the length of the apothem. $s = 8$ $n = 6$



$A = \frac{s \cdot a \cdot n}{2}$

$166.32 = \frac{8 \cdot a \cdot 6}{2}$

$166.32 = 24 \cdot a$

$\frac{166.32}{24} = a$

$a = 6.93\ cm$

(7) In the figure below, all the polygons are regular and all the hexagons are congruent. The measure of one side of one hexagon is 4 cm and the apothem measures 3.46 cm. The measure of the apothem of the pentagon is 2.75 cm. What is the difference between the area of one hexagon and the area of one pentagon? Express your answer in square metres.

hexagon $n = 6$, $s = 4$, $a = 3.46$

$A = \frac{s \cdot a \cdot n}{2}$

$= \frac{4(3.46)(6)}{2}$

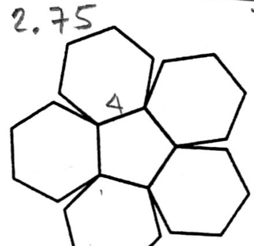
$A = 41.52\ cm^2$

pentagon $n = 5$, $s = 4$, $a = 2.75$

$A = \frac{s \cdot a \cdot n}{2}$

$= \frac{4(2.75)(5)}{2}$

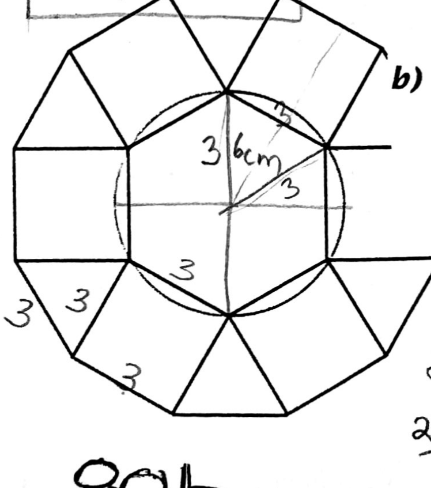
$= 27.5\ cm^2$



Answer: diff $41.52 - 27.5 = 14.02\ cm^2$

$0.001402\ m^2$

(8) Squares and equilateral triangles have been placed around the edges of a regular hexagon to form a regular dodecagon.



a) The regular hexagon is inscribed in a circle with a diameter of 6 cm. Determine the perimeter of the regular dodecagon.

$P = \text{side} \times n$

$= 3 \times 12$

$= 36\ cm$

b) The area of the hexagon is 23.4 cr[m²]. Calculate the area of the regular dodecagon.

$A = \frac{s \cdot a \cdot n}{2}$

$23.4 = \frac{3(a)(6)}{2}$

$23.4 = 9(a)$

$\frac{23.4}{9} = a$

$2.6 = a$

dodecag[on]

$a = 2.6 + 3$

$a = 5.6$

$n = 12$

$s = 3$

$A = \frac{(3)(5.6)(12)}{2}$

$= 100.8\ cm^2$