

# Circle Panels (7-11)

I represent the window plan panel shows in the picture here.

There are two circles, 1 and 2, that which have the same centre.

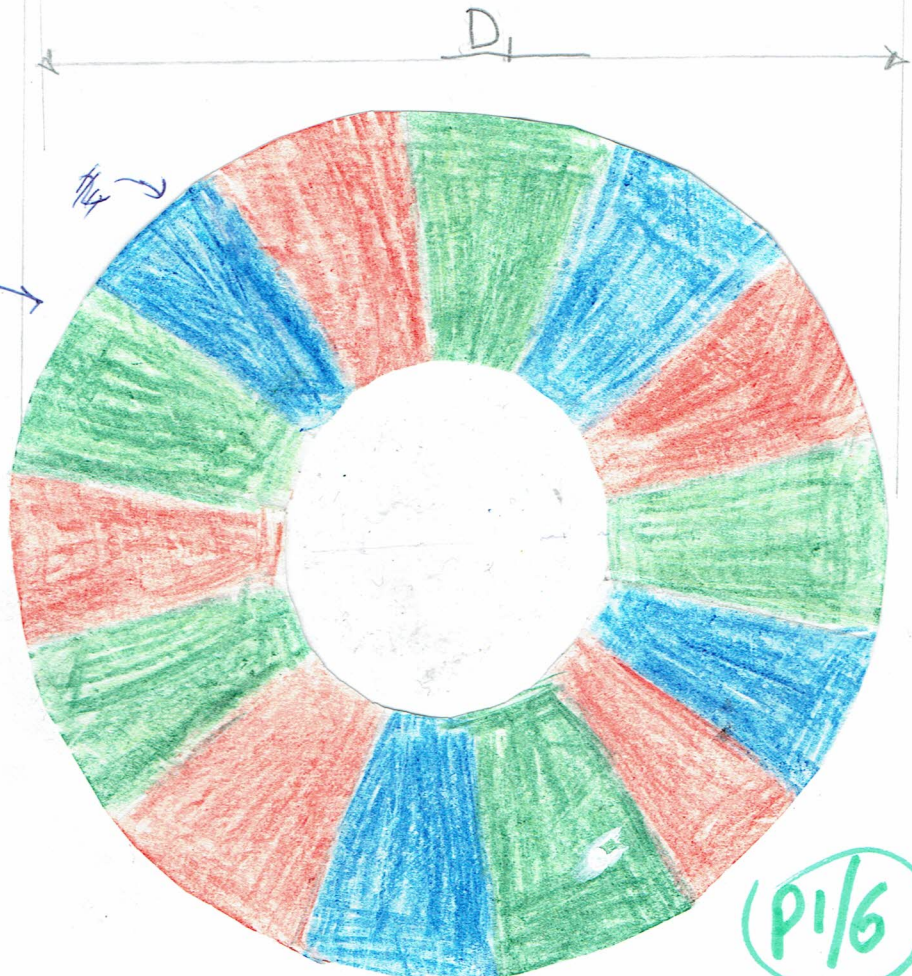
Radius

$$R_1 = \frac{D_1}{2}$$

$$R_2 = \frac{D_2}{2}$$

The colored pane is between circle 1 and 2

Circle 2



Let  $A_1$  represent ( $R_1$  circle 1)

$A_2$ : represent ( $R_2$  circle 2)

$$A_3 = A_1 - A_2$$

$A_3$  has 14 separate bits.

Fraction:  $\frac{5}{14}$  red,  $\frac{5}{14}$  green,  $\frac{4}{14}$  blue

$$\therefore \text{Red Area} = \frac{5}{14} \times A_3$$

$$\text{Green} = \frac{5}{14} \times A_3$$

$$\text{Blue} = \frac{4}{14} \times A_3$$

In order to find  $A_1$  and  $A_2$  we need to estimate area of circle

$$\text{area of circle} = \pi r^2$$

In order to find  $A_3$ , find  $A_1$  and  $A_2$ .

$$A_1 - A_2 = A_3$$

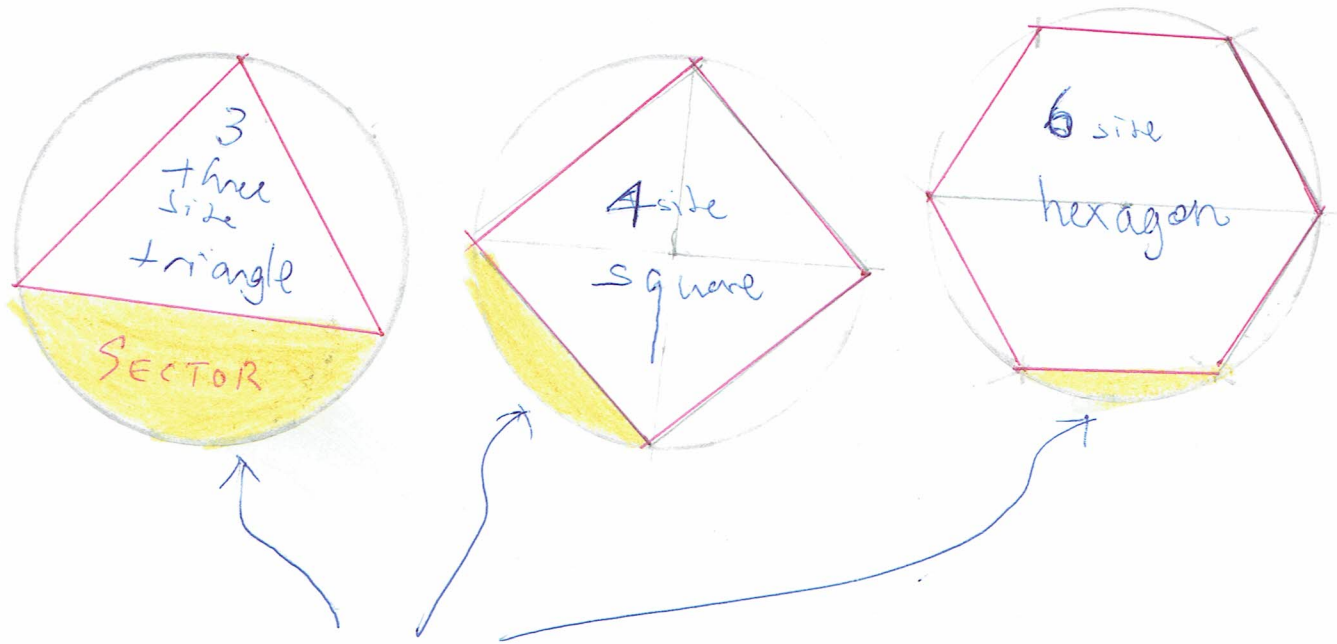
Method (1) use formula.

$$A_1 = \pi \left( \frac{D_1}{2} \right)^2 \quad A_2 = \pi \left( \frac{D_2}{2} \right)^2$$

Method 2: Use Area of Polygons to estimate  
the area of a circle

Refer to picture

This method is about polygons.



As we can see,  
with a hexagon the area  
is closer to a circle because  
missing in the sectors are less  
Refer to estimate method in the next  
few pages

Step 1 - construct a circle.

Radius of circle: 10 cm 1 unit.

Scale: 10 cm 1 unit

Step 2 - construct a square inscribed in a circle

Step 3 - construct an octagon

Step 4 - construct a 16-polygon.

16 sided polygon

Calculate area of polygons

(1) Area of square: 2 units<sup>2</sup>

(2) Area of octagon = 8 x area of  $\Delta COI$

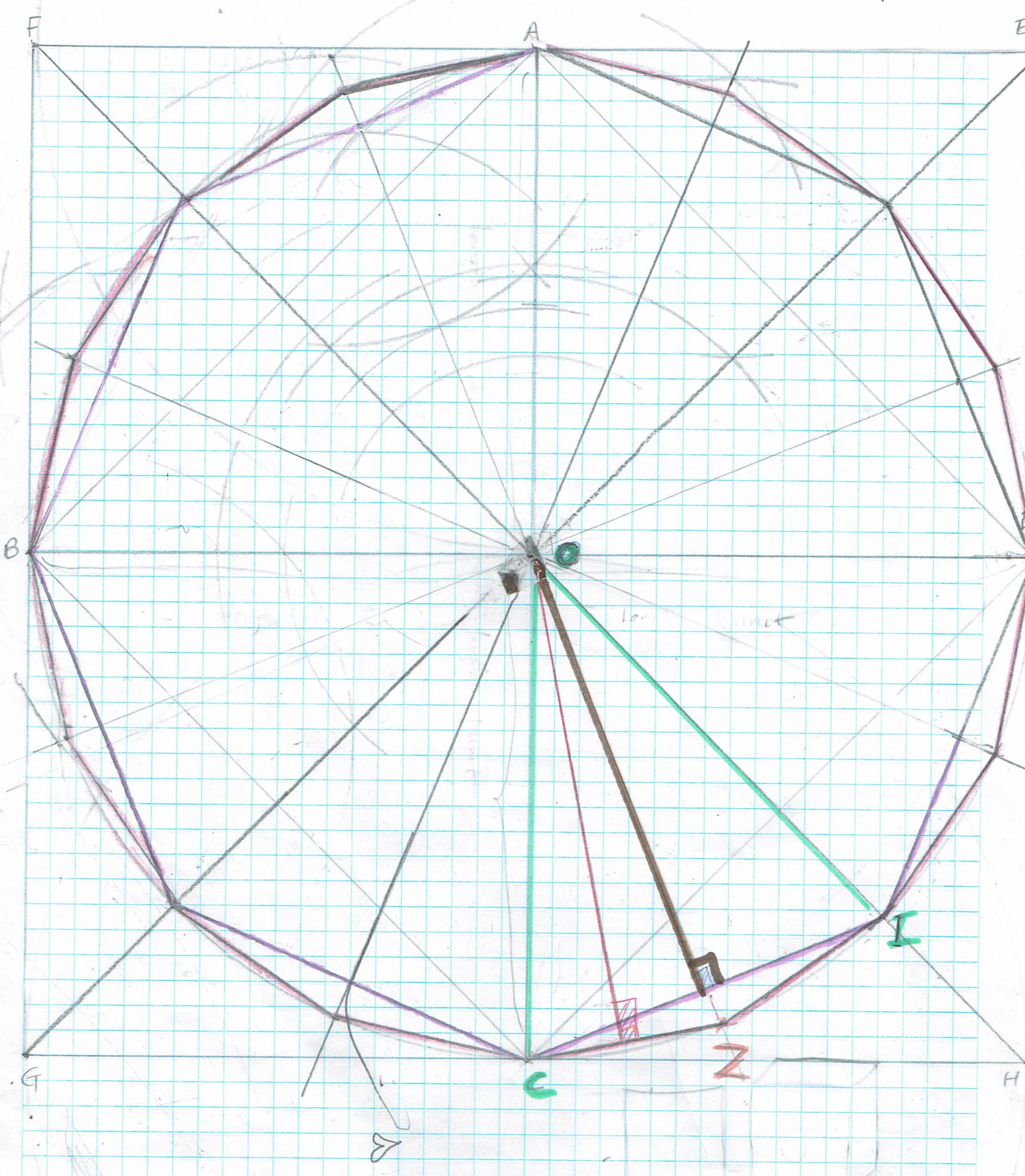
(3) Area of 16-polygon = 16 x area of  $\Delta ZOI$

$\Delta \text{area} = \frac{1}{2} \times B \times H$  B: Base H: Height

n of sided polygon	area estimated (unit <sup>2</sup> )
4 (square)	2
8 (octagon)	$\frac{1}{2} \times (0.75) \times (0.93)$ = 0.34875
16 (16-polygon)	$\frac{1}{2} \times (0.38) \times (0.93)$ = 0.18715

Use this data plot a graph

P4/6



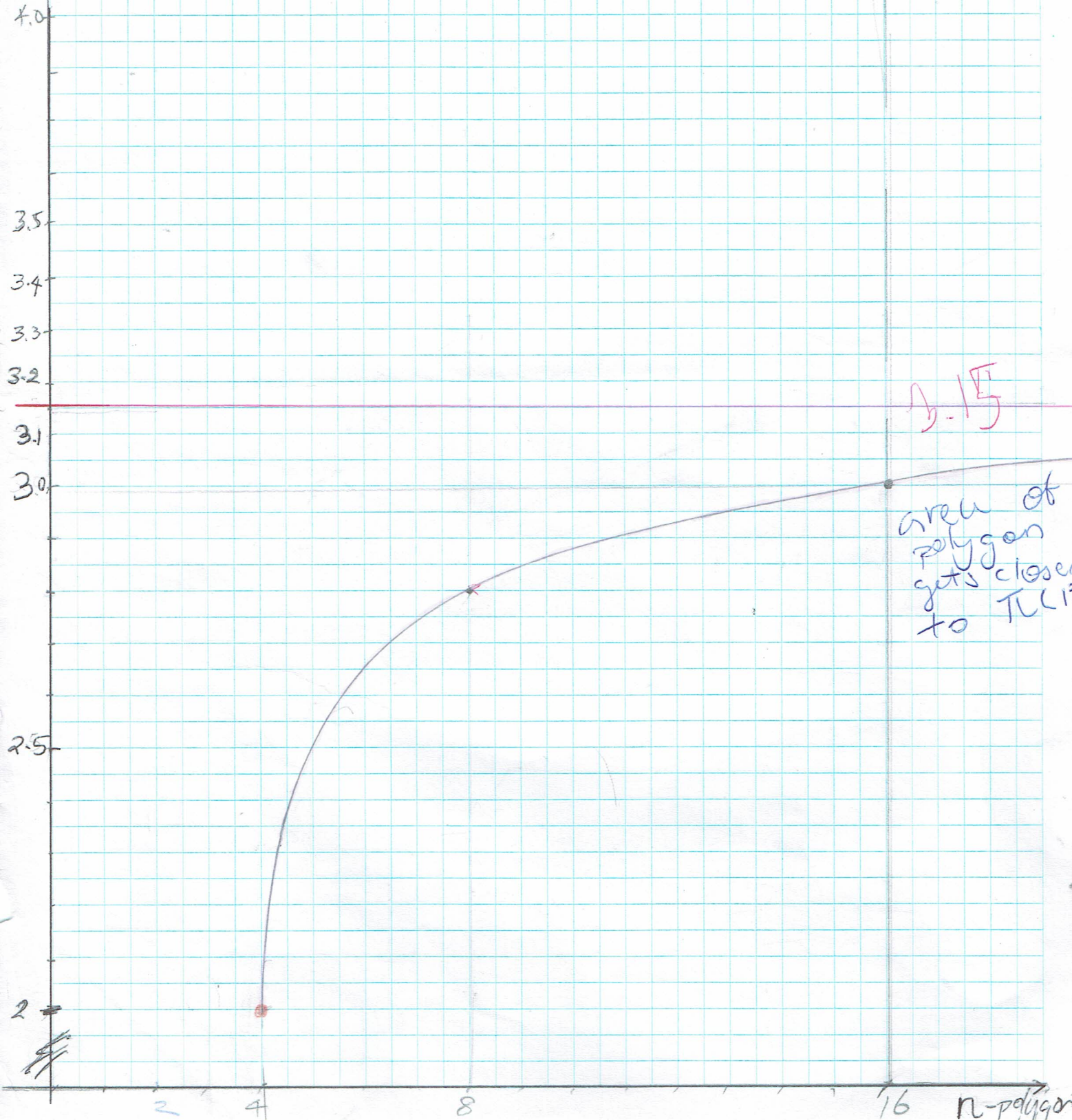
Circle area =  $\pi r^2$

PS/6



P6/G

AREA (UNIT<sup>2</sup>)



3.14

Area of polygon gets closer to  $\pi$

~~2~~

2

4

8

16 n-polygon