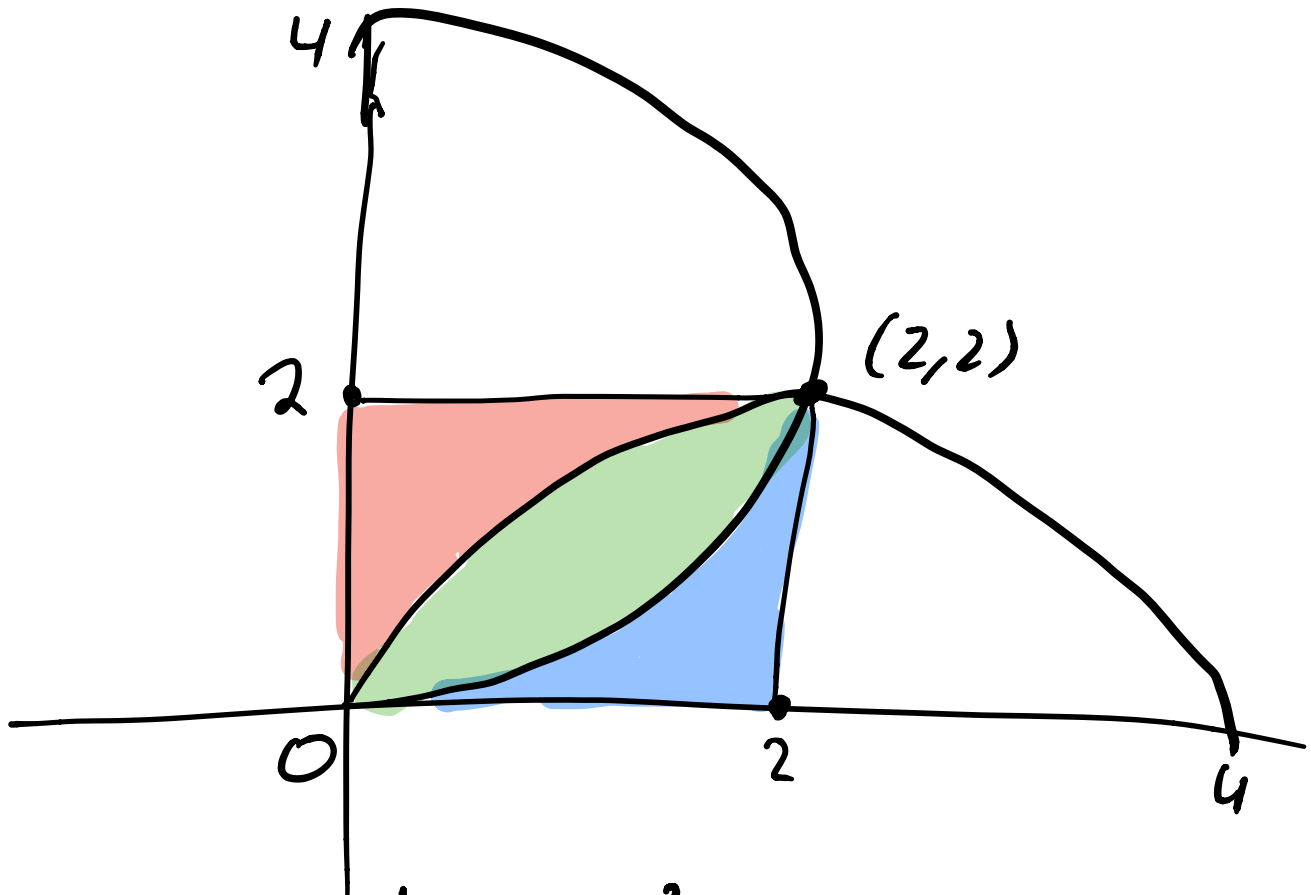


Two circles of rad 2 are centred at  
(2,0) & (0,2)

What is the area of intersection  
of their interiors?



$$\text{Blue} + \text{Green} = \frac{1}{4} \times \pi \times 2^2 = \pi \quad (1)$$

$$\text{Red} + \text{Green} = \frac{1}{4} \times \pi \times 2^2 = \pi \quad (2)$$

$$\text{Blue} + \text{Green} + \text{Red} = 2 \times 2 = 4 \quad (3)$$

Sub (1) into (3) :

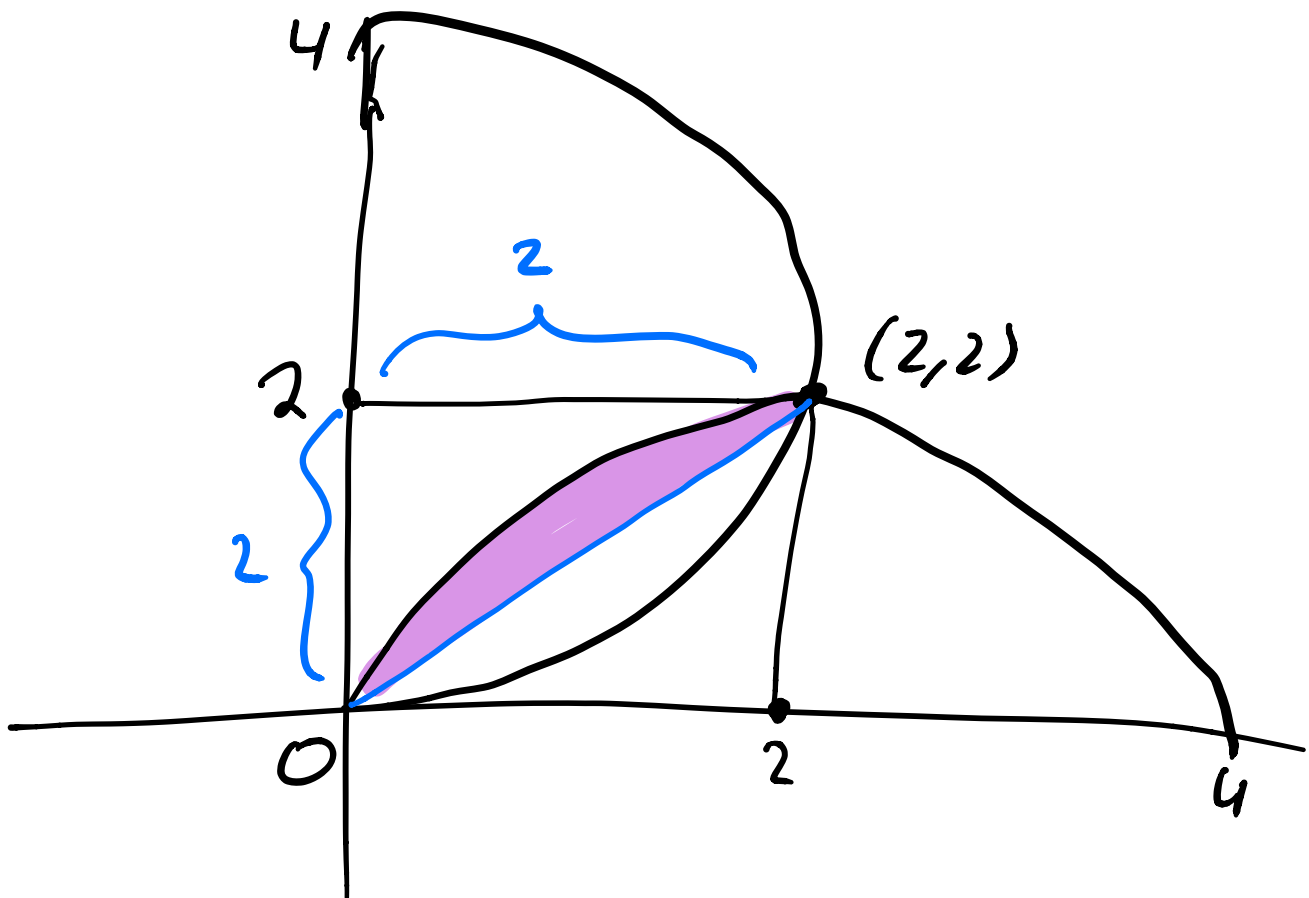
$$\pi + \text{Red} = 4 \Rightarrow \text{Red} = 4 - \pi \quad (4)$$

Sub (4) into (2) :

$$4 - \pi + \text{Green} = \pi$$

$$\Rightarrow \text{Green} = 2\pi - 4$$

Alternate solution :



Area of purple region is half of area of intersection.

We have

$$\text{Purple Area} = \text{Area of sector} - \text{Area of isosceles } \triangle$$

$$= \frac{1}{4} 4\pi - \frac{1}{2} (2)(2)$$

$$= \pi - 2$$

So the area of the whole intersection  
is  $2(\pi - 2)$