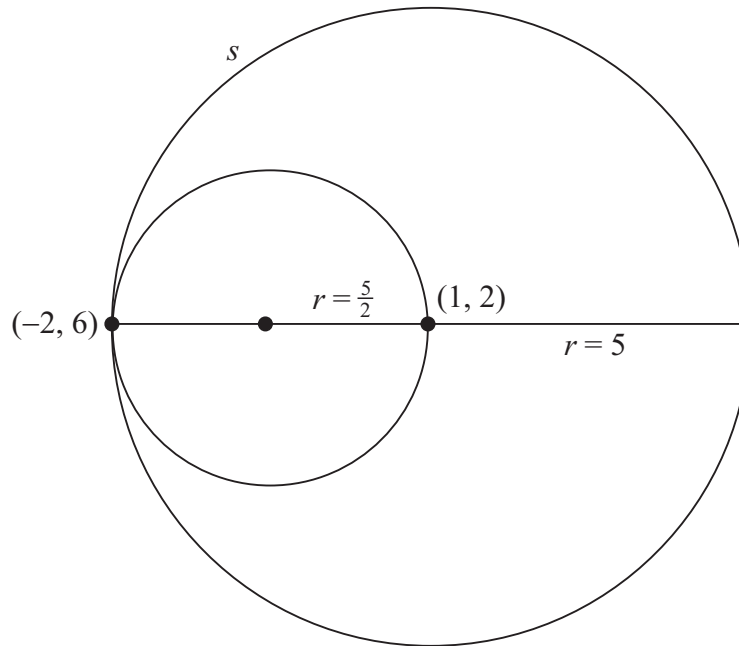


## SAMPLE PAPER 4: PAPER 2

### QUESTION 2 (25 MARKS)



$$s: x^2 + y^2 - 2x - 4y - 20 = 0$$

$$\text{Centre } (1, 2), r = \sqrt{1^2 + 2^2 + 20} = \sqrt{25} = 5$$

Centre $(h, k)$ , Radius $r$
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$(x - h)^2 + (y - k)^2 = r^2$
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$$\text{Radius of new circle: } r = \frac{5}{2}$$

Centre of new circle is midpoint of  $(1, 2)$  and  $(-2, 6)$ .

$$\text{Centre} = \left( \frac{-2+1}{2}, \frac{6+2}{2} \right) = \left( -\frac{1}{2}, 4 \right)$$

$$\text{Equation of new circle: } \left( x + \frac{1}{2} \right)^2 + (y - 4)^2 = \left( \frac{5}{2} \right)^2$$

$$x^2 + x + \frac{1}{4} + y^2 - 8y + 16 = \frac{25}{4}$$

$$x^2 + y^2 + x - 8y + 10 = 0$$


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