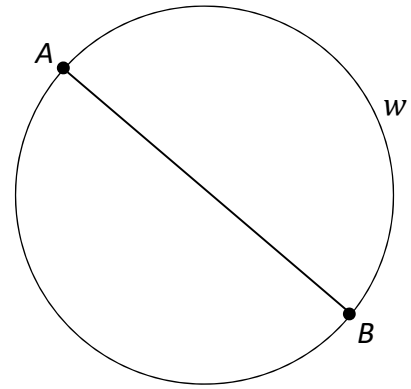


### Question 4

**(25 marks)**

The points  $A(1, 8)$  and  $B(9, 0)$  are the end-points of a diameter of the circle  $w$ , as shown in the diagram.



- (a)** Find the co-ordinates of the centre of  $w$ .

[illegible]

- (b)** Find the length of the radius of  $w$ . Give your answer in the form  $p\sqrt{q}$ , where  $p, q \in \mathbb{N}$ .

[illegible]

- (c)** Hence write down the equation of the circle  $w$ .

[illegible]

- (d) Find the equation of the line that is a tangent to the circle  $w$  at  $A$ .  
Give your answer in the form  $ax + by + c = 0$ , where  $a, b$ , and  $c \in \mathbb{Z}$ .

This image shows a full page of blank graph paper. The grid consists of thin, light gray horizontal and vertical lines that intersect to form small squares across the entire surface. There are no margins, text, or other markings on the paper.