MEMORANDUM

Name: ..... Class: .....

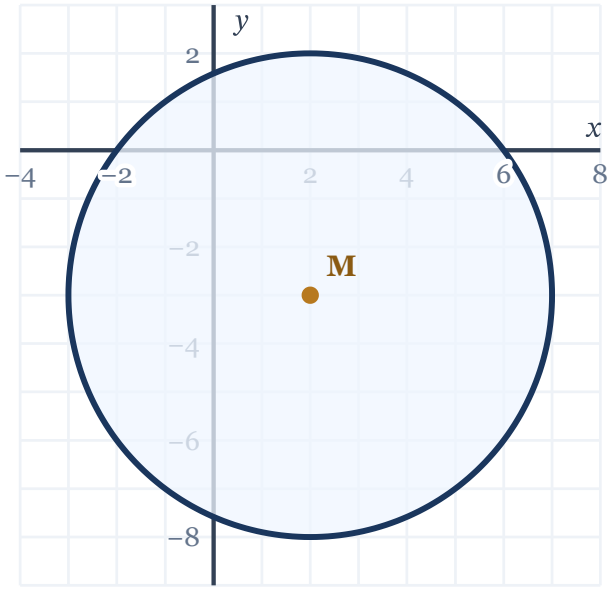
Date: .....

MARK ____ / 18

Answer all questions. Show all your working — marks are awarded for method as well as the final answer. **Teacher copy: accept any correct equivalent method.**

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1 Write down the centre and radius of $(x-2)^2+(y+3)^2=25$. (2)



> Centre **(2 ; −3)**, radius **5** ✓✓ (2)

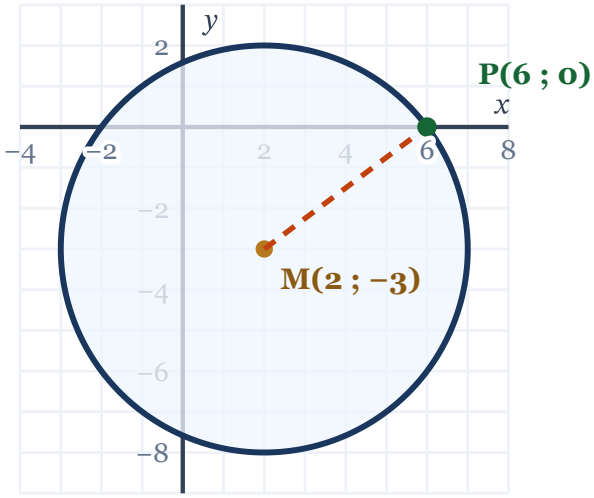
2 Determine the centre and radius of $x^2+y^2-4x+6y-12=0$. (4)

> Completing the square: $(x-2)^2+(y+3)^2=25 \rightarrow$ centre **(2 ; −3)**, $r=5$ ✓✓✓✓ (4)

3 Show that P(6 ; 0) lies on the circle $x^2+y^2-4x+6y-12=0$. (2)

> $(6-2)^2+(0+3)^2=16+9=25=r^2$, so **P lies on the circle.** ✓✓ (2)

4 Determine the gradient of the radius MP where M$(2\ ;\ -3)$ and P$(6\ ;\ 0)$. (2)

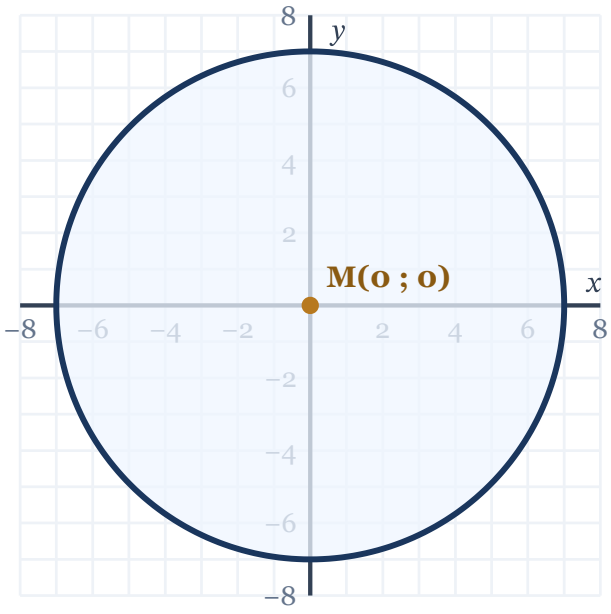


$\frac{3}{4}$ ✓✓ (2)

5 Determine the equation of the tangent to the circle at P$(6\ ;\ 0)$. (3)

$m = -\frac{4}{3} \rightarrow y = -\frac{4}{3}x + 8$ ✓✓✓ (3)

6 Write down the equation of a circle with centre $(0\ ;\ 0)$ and radius 7. (1)

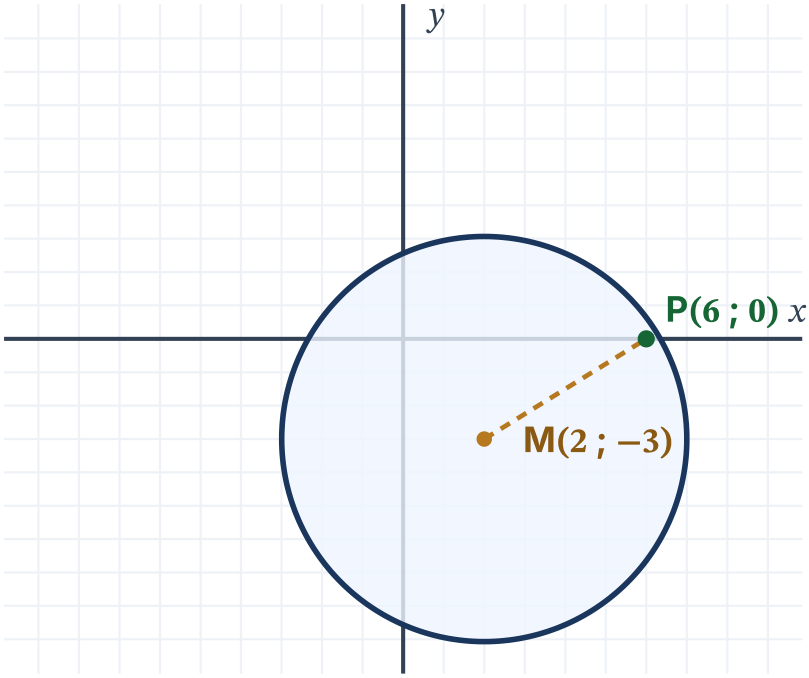


$x^2 + y^2 = 49$ ✓ (1)

7 Determine the radius of $x^2 + y^2 + 2x - 8y + 8 = 0$. (3)

$(x + 1)^2 + (y - 4)^2 = -8 + 1 + 16 = 9 \rightarrow r = 3$ ✓✓✓ (3)

8 What is the relationship between a tangent and the radius at the point of contact? (1)



They are **perpendicular**. ✓ (1)

TOTAL: 18 marks

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