8.9 Perpendicular Lines and the equation of a tangent: 10-minute Pack

EDEXCEL 1MA1 · Calculator allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 For the circle $x^2 + y^2 = 25$, write down the equation of the tangent at the point (3, 4).

(Total for Question 1 is 2 marks)

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2 Find the equation of the tangent to the circle $x^2 + y^2 = 625$ at the point (7, 24).

(Total for Question 2 is 2 marks)

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3 The circle has equation $(x - 1)^2 + (y + 2)^2 = 25$ and P is the point (5, 1) on the circle.
Find the equation of the line through P that is perpendicular to the tangent at P.

(Total for Question 3 is 2 marks)

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4 The circle $x^2 + y^2 = 50$ meets the vertical line $x = 5$ at two points. Take the point with positive y-coordinate.
Work out the equation of the tangent to the circle at this point.

(Total for Question 4 is 3 marks)

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Mark scheme · 8.9 Perpendicular Lines and the equation of a tangent: 10-minute Pack

Question 1

use tangent gradient -3/4 and substitute point to find intercept oe	**M1**
y = -3/4 x + 25/4 cao	**A1**

Answer: y = -3/4 x + 25/4

Question 2

use xx0 + yy0 = r^2 or find slope -7/24 then form equation oe	**M1**
7x + 24y = 625 cao	**A1**

Answer: 7x + 24y = 625

Question 3

find gradient of radius = (1 - (-2)) / (5 - 1) = 3/4 or identify perpendicular slope oe	**M1**
equation y - 1 = 3/4 (x - 5) or y = 3/4 x - 11/4 cao	**A1**

Answer: y = 3/4 x - 11/4

Question 4

find y: y^2 = 50 - 25 so y = 5 (positive) oe	**M1**
find tangent gradient -x/y = -5/5 = -1 oe	**M1**
y = -x + 10 cao	**A1**

Answer: y = -x + 10

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