Perpendicular Lines and the equatio

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The Personalised GCSE Revision Site

1) Perpendicular Lines and the equation of a tangent: Easier

7. A circle C has centre $(2,5)$ (x_1, y_1)
The point A $(11, 8)$ (x_2, y_2) lies on the circumference of the circle

Find the equation of the tangent to the circle at A

Gradient of radius: $\frac{y_2 - y_1}{x_2 - x_1}$

$= \frac{8-5}{11-2}$

$= \frac{3}{9}$

$= \frac{1}{3}$

perpendicular gradient $= -3$

$y = -3x + c$ $(11, 8)$ $(x\ y)$

$8 = -3(11) + c$

$8 = -33 + c$

$c = 41$

$y = -3x + 41$ ..... (5)

1) Perpendicular Lines and the equation of a tangent: Medium

8. A cirlce has the equation $x^2+y^2=5$

a) Write down the centre of the circle

(0,0) (1)

b) Write down the exact length of the radius of the circle

$\sqrt{5}$ (1)

P is the point (1,2) on the cirlce $x^2+y^2=5$

c) Work out the equation of the tangent to the circle at P

(0,0) (1,2)
$x_1\ y_1$ $x_2\ y_2$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{2-0}{1-0}$$

$$= 2$$

perpendicular gradient $= -\frac{1}{2}$

$y = -\frac{1}{2}x + c$ (1,2)
$x\ y$

$2 = -\frac{1}{2}(1) + c$

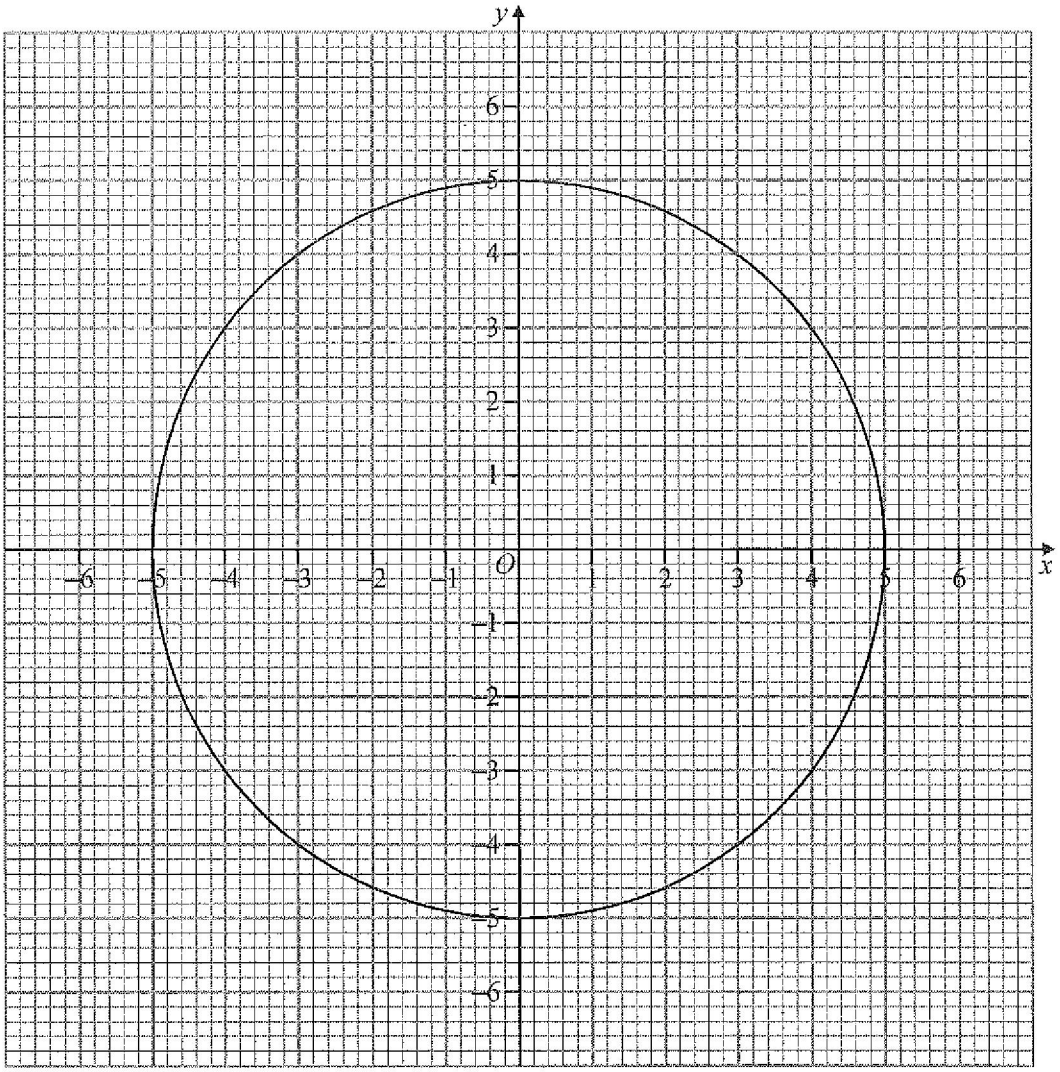
$2 = -\frac{1}{2} + c$

$2\frac{1}{2} = c$

$y = -\frac{1}{2}x + \frac{5}{2}$ (4)

1) Perpendicular Lines and the equation of a tangent: Harder

9. The diagram shows a circle of radius 5 cm, centre the origin.



Find the equation of the tangent to the circle at (3,4)
x y

$$m = \frac{y_2 - y_1}{x_2 - x}$$
$$= \frac{4-0}{3-0}$$
$$= \frac{4}{3}$$

perpendicular gradient $= -\frac{3}{4}$

$y = -\frac{3}{4}x + c$

$4 = -\frac{3}{4}(3) + c$

$y = -\frac{3}{4}x + \frac{25}{4}$ (5)