

Solutions

1a.

Centre $C(5, -2)$	M1
Radius $= \sqrt{25} = 5$ Therefore diameter = 10	M1

1b.

Gradient $m = \frac{2 - -2}{7 - 5} = 2$	M1
Equation of the line is: $y - 2 = 2(x - 7)$ $y - 2 = 2x - 14$	M1
$y = 2x - 12$	M1

1c.

$CP = \sqrt{(7 - 5)^2 + (2 - -2)^2}$	M1
$= \sqrt{20} = 2\sqrt{5}$	M1

1d.

$y = 2x$ $(x - 5)^2 + (2x + 2)^2 = 25$	M1
$x^2 - 10x + 25 + 4x^2 + 8x + 4 = 25$ $5x^2 - 2x + 4 = 0$	M1
Discriminant: $(-2)^2 - 4(5)(4) = -76$ as discriminant is less than 0	M1
There are no real roots and therefore line does not intersect.	M1



Solutions

1a.

Centre: $(\frac{-2+8}{2}, \frac{11+1}{2})$ $= (3, 6)$	M1
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1b.

$r^2 = (8 - 3)^2 + (6 - 1)^2 = 50$	M1
Equation of C is, $(x - 3)^2 + (y - 6)^2 = 50$	M1 M1

1c.

When $x = 10, y = 7$ $(10 - 3)^2 + (7 - 6)^2 = 7^2 + 1^2 = 50$	M1
Therefore $(10, 7)$ lies on C.	M1

1d.

Gradient of $MP = \frac{7-6}{10-3} = \frac{1}{7}$	M1
Gradient of tangent = -7	M1
Equation of tangent is: $y - 7 = -7(x - 10)$ $y - 7 = -7x + 70$	M1
$y = -7x + 77$	M1



Solutions

1a.

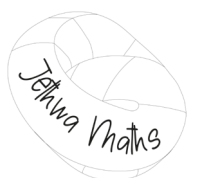
$(x - 2)^2 - 4 + (y + 5)^2 - 25 = k$ $(x - 2)^2 + (y + 5)^2 = k + 29$	M1
Centre at (2, -5)	M1

1b.

$r^2 = k + 29$ As $r > 0$	M1
$k + 29 > 0$ $k > -29$	M1

2.

$r^2 = (-1)^2 + (7)^2 = 50$	M1
Equation of C: $(x - -1)^2 + (y - 7)^2 = 50$	M1
$(x + 1)^2 + (y - 7)^2 = 50$	M1



Solutions

1a.

$x^2 + y^2 - 20x - 24y + 195 = 0$	M1
$(x - 10)^2 - 100 + (y - 12)^2 - 144 + 195 = 0$	
$(x - 10)^2 + (y - 12)^2 = 49$	M1
Centre: $M = (10, 12)$	M1

1b.

Radius = $\sqrt{49} = 7$	M1
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1c.

$MN = \sqrt{(25 - 10)^2 + (32 - 12)^2}$	M1
$= \sqrt{625} = 25$	M1

1d.

$NP = \sqrt{(25)^2 - (7)^2}$	M1
$= \sqrt{576} = 24$	M1

