

## Revision F5 (Topics 20-21) [35] MARKSCHEME

1.

$$(x - 5)^2 - 30 = 0$$

M1

*For attempt at  $(x - 5)^2$ ,*

$$x = \pm\sqrt{30} + 5$$

A1

*For -5 and -30*

$$x = 10.48, -0.48$$

A1

*Both answers (Accept 10.5, -0.477)*

### ALTERNATIVE

$$x = \frac{10 \pm \sqrt{10^2 - 4 \times 1 \times -5}}{2 \times 1}$$

M1

*For substitution into formula (allow one error)*

$$x = \frac{10 \pm \sqrt{120}}{2}$$

A1

*Correct substitution*

$$x = 10.48, -0.48$$

A1

*Both answers (accept 10.5, -0.477)*

[3]

2.

(i)  $114^\circ \pm 4$       and       $246^\circ \pm 4$       [B1, B1]

(ii)  $41^\circ \pm 4$       and       $319^\circ \pm 4$       [B1, B1]

3.

(a)  $(a =) 5$       B1

$(b =) 15$       B1

(b) 15      B1 ft

*their b*

[3]

4..

(a) Circumference =  $2\pi r$       so  $2\pi r = 20\pi$       [M1]

Radius = 10      [A1]

Equation of circle is  $x^2 + y^2 = 100$       [A1]

(b) Attempt to find gradient of radius =  $\frac{4-0}{5-0} = \frac{4}{5}$       [M1]

Perpendicular gradient is  $-\frac{5}{4}$       [M1] negative reciprocal of *their* gradient

Attempt to find equation of line e.g.  $y - 4 = -\frac{5}{4}(x - 5)$       [M1] oe

$y = -\frac{5}{4}x + \frac{41}{4}$       [A1] oe

$5x + 4y = 41$

$p = 8$  and  $q = 82$       [A1]

5.

431	B1 for use of Pythagoras involving the unknown length P1 for setting up an equation equivalent to $x^2 = 15^2 - 5^2 - 7^2$ P1 for finding the volume using their " $\sqrt{15^2 - 5^2 - 7^2}$ " A1awrt 430.5
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6.

$$y^2 = (3x - 1)^2 \quad \text{M1}$$

$$9x^2 - 3x - 3x + 1 \quad \text{A1}$$

$$x^2 + 9x^2 - 6x + 1 = 16 \quad \text{M1}$$

$$10x^2 - 6x - 15 = 0 \quad \text{A1}$$

$$x = 6 \pm \sqrt{(636) \div 20} \quad \text{M1}$$

*Allow one error in formula*

$$x = -0.96 \text{ and } 1.56 \quad \text{A1}$$

$$y = -3.88 \text{ and } 3.68 \quad \text{Must have y values for last A1} \quad \text{A1}$$

[7]

7.

$$\text{Angle } ATB = 22^\circ \quad \text{B1}$$

$$\frac{BT}{\sin 48} = \frac{50}{\sin 22} \quad \text{M1}$$

$$\frac{AT}{\sin 110} = \frac{50}{\sin 22}$$

$$BT = \frac{50 \sin 48}{\sin 22} \quad \text{M1}$$

$$AT = \frac{50 \sin 110}{\sin 22}$$

$$BT = 99 \text{ or } 99.19 \text{ or } 99.2 \quad \text{A1}$$

$$AT = 125 \text{ or } 125.4(\dots) \text{ or better accuracy}$$

$$h + 60 = \text{'their } BT' \times \sin 70 \quad \text{M1dep}$$

*Dependent on previous use of sine rule.*

$$h + 60 = \text{'their } AT' \times \sin 48$$

$$\text{oe } \frac{h + 60}{\text{their } BT} = 70$$

$$h = 33, \text{ or } 33.2 \text{ or } 33.21 \quad \text{A1}$$

*or better accuracy*