

Revision F5 (Topics 20-22) [27] MARKSCHEME

1.

- (a) $180 - 90 - 62$ or $90 - 62$ M1
oe
- 28 A1
- (b) $\angle Q = 80^\circ$
 or reflex $\angle POR = 200^\circ$ M1
Note: 80° may be seen on diagram
- 160 A1
- (c) $\angle A = 44^\circ$ M1
 or third \angle at $C = 86^\circ$ M1
Allow $180 - 44 - 50$
- (z =) 86 A1
- 'Alternate segment' B1
oe

[7]

2.

$3 \pm \sqrt{17}$	M1	For $(x - 3)^2 - 9 - 8 (= 0)$ or $(x =) \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(-8)}}{2(1)}$ allow sign error for b
	M1	For $x - 3 = \pm \sqrt{17}$ or $x = \frac{6 \pm \sqrt{68}}{2}$
	A1	cao

3.

(a)		(1, 4)	B1
(b)		-0.4, 2.4	B1
(c)		3.75	B1 accept 3.7 – 3.8

4.

- $3x^2 = x + 2$ M1
- $3x^2 - x - 2 = 0$ A1
- $(3x + 2)(x - 1) = 0$ M1
or $[1 \pm \sqrt{1 - -24}]/6$
- $x = 1$ or $-\frac{2}{3}$ A1
Accept -0.66 or -0.67
- $y = 3$ or $\frac{4}{3}$ A1 ft
- Must match appropriate values of y with x
 $x = 1, y = 3$ without working ...SC1*

[5]

5.

$AC^2 = 20^2 + 20^2 = 800$ $AX^2 = 10^2 + 10^2 = 200$ $\sqrt{200} \times \tan 55 = VX \quad (= 20.19\dots)$ $VM^2 = \sqrt{20.19^2 + 10^2} \quad (= 22.54\dots)$ $4 \times \frac{1}{2} \times 22.54 \times 20 + 20^2$	1300	Let X be centre of base, M be midpoint of AB P1 process to find AC or AX P1 process to find VX or VA P1 process to find height of sloping face or angle of sloping face. P1 process to find surface area of one triangular face. A1 For 1300 – 1302
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6.

 $ABD = 66$ (Alt segment)

B1

or angles in triangle if ADB found first **$DCB = 104$ (opposite in cyclic)**

B1

*In all alternatives, for first 3 B marks do not award B1 the first time no reason or wrong reason given, otherwise accept angles identified in answer or on diagram.**NB Mark 'positively' ie, ignore wrong values or reasons unless totally contradictory.* **$DBC = 38$ (isosceles)** **$CBA = 104$**

B1

 $CBA + BAD = 180$ (interior)

B1

*In all alternatives, reason must be given for final B1**Accept 'allied' or 'angles between parallel lines'. Dependent on correct angles.***Alt. 1 $ADB = 38$ (Alt segment)**

B1

 $DCB = 104$ (opposite in cyclic)

B1

 $CBD = 38$ (isosceles)

B1

 $CBD = ADB$ (alternate)

B1

Use of 'Z angles' is not acceptable

*Dependent on correct angles***Alt. 2 $ADB = 38$ (Alt segment)**

B1

 $DCB = 104$ (opposite in cyclic)

B1

 $BDC = 38$ (isosceles) **$ADC = 76$**

B1

 $BDC + BCD = 180$ (interior)

B1

*Dependent on correct angles***Alt. 3 $ADB = 38$ and $ABD = 66$ (Alt segment)**

B1

 $DCB = 104$ (opposite in cyclic)

B1

 $CBD = CBD = 38$ (isosceles)

B1

 $DCB = CBA$ and CDA and $BAD =$ (isosceles trapezium)

B1

[4]