Topic 17 Area and volume (Pre-TT) [38] MARKSCHEME

1. Area $= \frac{1}{2} \times 5 \times 8 \times \sin 41$ [M1]

   13.1   [A1]

2.

$\frac{4}{3} \pi 7.5^3$ or $\frac{2}{3} \pi 7.5^3$ M1

883.1 to 883.6   A1*

18.5 used as height   B1

$\frac{1}{3} \pi 7.5^2 \, 18.5$ M1

          Allow 26 here

1089.1 to 1089.75   A1*

         (*) score one of these only

1972 to 1973.35   A1

        Use of r as 15 throughout gives 9660   SC2

                                                      [5]

3.

(a) $2 \times \pi \times 9$ M1

         oe

     $\frac{80}{360} \times$ their $(2 \times \pi \times 9)$ M1

     $4\pi + 18$ A1

         oe

(b) $\pi \times 9^2$ M1

     $\frac{80}{360} \times \pi \times 9^2$ M1 dep

     or $\pi \times 9^2 \times 10$

     180π A1

        oe Must see some correct simplification of $\frac{80}{360} \times \pi \times 9^2 \times 10$

     cm^3 B1

        Units mark

                                                       [7]

4.

Slant height top cone = 13 cm		B1
Slant height bottom cone $\sqrt{(5^2+6^2)}$		M1
Must have $\sqrt{}$		
Slant height = 7.8(1...)		A1
Area = $\pi \times 5 \times 13$		DM1
or $\pi \times 5 \times$ their '7.8'		
Either slant height can be used but M1 must be awarded for calculating slant height of bottom cone		
= 327 or 326.9 or 326.89 or 326.88(...)		A1
NB. Anything involving the area of the two circular "bases' can be ignored except if it affects the final answer		

[5]

5.

Breaks proB1em down into sum of lines and (semi-)circles		M1
Length of lines 4.1 + 5.9 + 4.7 + 2.9 (= 17.6)		A1
Sc 17.6 only B1		
Use of $2\pi r \div 2$		DM1
or $\pi d \div 2$ but must use with numbers.		
Length of semi-circles		A1
$0.9\pi+0.6\pi+0.7\pi$ (=6.9(11..))		
2.8, 1.9, 2.2		
Total = 24.5(...)		A1 ft
ft on 1 arithmetical or 'reading from scale' error and both M's awarded.		
4.1 = 2.9 + 0.6 + 0.6, 5.9 = 0.6 + 0.6 + 2.9 + 1.8, 4.7 = 2.9 + 1.8, 2.9 = 2.9		

[5]

6.

1361	P1	process using similar triangles to find base of small cone eg. 4 cm used as diameter or 2 cm used as radius
	P1	process to find volume of one cone
	P1	complete process to find volume of frustum
	P1	complete process to find mass or 1360 – 1362
	A1	1361 or 1360 or 1400

7.

$\frac{1}{2}x \times (2x) \times \sin 30 = 50$ [M1]

$\sin 30 = \frac{1}{2}$ [B1]

$\frac{1}{2}x^2 = 50$ [A1] oe

$x^2 = 100$

So $x = 10$ since $x > 0$ [A1] 1 answer only

8.

volume cylinder = 113.(...) cm^3 *Accept 36π*   B1

volume cone = 18.8(...)cm^3 B1
          Accept 6π

Volume (their cylinder – their cone) ÷ 9π   M1
          Accept 30π ÷ 9π

3.3(3)   A1
= 5.3(3...)   A1ft

Accept fraction. (5 1/3)
f.t. iff M1 awarded.
Consistent use of diameter for radius gives 144π (= 452.39) for
cylinder and 24π (=75.40) for cone.
Volume = 120π (376.99). Volume ÷ 36π = 3.333.. + 2 = 5.333
Give B0, B1, M1, A1, A1 f.t.
Hence do not give full marks if answer seen on answer line.
Check working before awarding full marks.
Do not accept 5 as a answer.

[5]