SIMIRALITY AND CONGRUENCY MARKING SCHEME

1.	**Test for equiangualarity:** < AXB = <CXD.....Vertically opposite angles <BAX = <CXD.....Angles subtended by the same chord BC in the same segment <ABX = <DCX.....Remaining angles in the triangles must be equal(or angles subtended by same chord AB) Triangle AXB and DXC are therefore equiangular. **Test for equal sides:** <CAD = <ACB..... alternate angles But <CAD is subtended by chord CD and angle ACB is subtended by chord AB Side AB = side CD and both are corresponding sides. Triangle ABX and DXC are congruent because of AAS i.e. Angle side **1989Q15**	4M
2.	AC = 3cm + 2cm = 5cm AE : AC 3 : 5 $\left(\frac{3}{5}\right)^2$ = 9:25 or $\frac{9}{25}$ **1990Q7**	2M
3.	$^1/_6$ x 12 DE = 2cm **1991Q6**	3M
4.	A. S. F = $\left(\frac{3}{5}\right)^2$ = $^4/_{25}$ Ratio of area Δ ABC to ΔAED = $^4/_{25}$ Therefore: $\frac{25}{25} - \frac{4}{25} = \frac{21}{25}$ Ratio of ΔABC to trapezium = 21:25 **1992Q5**	3M
5.	(a)<ACD = <BCD.....common to both <DAC = <BDC.....alternate angle theorem <ADC = <CBD.....remaining angles must be equal Thus Δ ADC and ΔBDC are equiangular ΔADC and ΔDBC are similar (b) (i) AB = 5cm (ii) < ACD = 22.62^0 **1992Q21**	8M
6.	<AED = <BEC.....Vertically opposite angles <ADE = <EBC..... Subtended by the same arc AC <DAE = BCE..... Subtended by the same arc BD ΔAED and Δ BEC are equiangular hence similar. **1992Q15**	3M
7.	EC = $^3/_5$ x 8 =4.8 DC = $^4/_5$ x 5 = 4cm Area of ABDE = Area of ABC – Area of DCE $\left(\frac{1}{2} \times 5 \times 8 \sin 30^0\right)$ - $\left(\frac{1}{2} \times 4.8 \times 4 \times \sin 30^0\right)$ = 10 – 4.8 = 5.2cm^2 **1993Q16**	3M
8.	V .S.F = $\left(\frac{4}{3}\right)^3$ $\frac{64}{27}$ or 64:27 **1993Q2**	2M

9.	3 x 1000 litres V. S .F = $\frac{3000}{1.5}$ = $\frac{2000}{1}$ L. S. F = $\sqrt[3]{\frac{2000}{1}}$ = 12.599 30 x 12.5992105 = 377.976315 = 378cm **1994Q9**	3M
10.	V.S.F = $\left(\frac{3}{5}\right)^3 = \left(\frac{27}{125}\right)$ $\frac{125}{27}$ X 8.1 =37.5m^3 **1995Q10**	3M
11.	Vol. Of container = 36 x 24 x 18 = 15,558cm^3 V.S.F = (L.S.F)^3 = 1:216 216 = 15,558 = $\frac{15558}{216}$ = 72cm^2 = 72cm^2 **1996Q10**	B1 M1 M1 A1 4M
12.	a). <AEB=<DEC, Vertically opp. <s <ABE=<EDC, alternative <S <EAB=<ECD, alternate <S ΔABE is similar to Δ CDE(AAA) b). BE=3ED DB:EB=4:3 **2002Q15**	 B1 B1 B1 B1 4M

13.	Volume scale factor = $\frac{4752}{1408}$ = 23.376 v.s.f = (l.sf)^3 l.s.f = 3 3.376 = 1.5 Area factor = (l.s.f)^2 = 1.52 =2.25 Area of larger cylinder = 352 x 2.25 = 792cm^2 **2005Q8**	M1 M1 M1 A1 4 M
14.	a). Volume of water = $\frac{6}{9+x}$ = $\frac{2}{x}$ x = 4.5 ; volume = $^1/_3$x 3.142(62x13.5-23x4.5) = 508.94 -18.25 = 490.09 b). i). Volume of sphere Top radium $^r/_{14.5}$ = $^2/_{4.5}$ r=6.440 Volume = $^1/_3$ x 3.142 (6.4442 x 14.5 - 62 x 13.5 = 121.6 = 121 $^{11}/_{15}$ ii). $^4/_3$Jr^3 = 121.6 r^3 = 121.6 x $\frac{3}{4}x$ r = 3.073 **2009Q21**	M1 M1 A1 M1 A1 M1 M1 A1 10M
15.	L.S.F = 8:24 = 1:3 V.S.F = 1:27 = 160 x 27 – 160 = 4160cm^3 **2011Q16**	B1 M1 A1 3

16. (a)	Length of RT $= {}^{3}/_{5}$ x10 = 6cm	 M1 A1
(b) (i)	Perpendicular distance between PQ & RS = 10sin 40 = 6.4cm	 M1 A1
(ii)	$\frac{TS}{sin40} = \frac{6}{sin60}$ TS = $\frac{6\ xsin40}{sin60}$ = 4.5cm	M1 A1
(c)	Length RS using cosine rule $RS^2 = 6^2 + 4.5^2 - 2$ x4.5 x 6 cos80 =46.87299841 = RS = 6.8	M1 A1
(d)	Area of ΔRST $= {}^{1}/_{2}$ x 6 x 4.5sin80 =13.3 **2012Q24**	M1 A1 10