

2005 Junior Cert Higher maths paper 2 the Answers ©John Brennan

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Health warning we try to be accurate but we are only human.

**Question 1(a)**  $\pi(11)^2 = 121\pi = 380$ , (ii)  $\frac{1}{3}(380) = 127$ .

(b)(i)  $A = 2\pi(7)20 = 280\pi$ . (ii) *Total surface area*  $= 280\pi + 2\pi 7^2 + \pi 7^2 = 427\pi$

©(i)  $\frac{1}{3}\pi x^2(3x) = \pi x^3$  (ii)  $\frac{V_1}{V_2} = \frac{\frac{1}{3}\pi(2x)^2 \frac{3x}{2}}{\pi x^3} = \frac{2\pi x^3}{\pi x^3} = 2:1$

**Question 2** (a)(i) Slope of ab is 5/3. (ii) Equation of ab  $5x-3y+7=0$

(b)(i)  $h=1$ ,  $p(-1,1)$ ,  $k=6$ ,  $q=(6,0)$ , (ii)  $r=(3,4)$  (iii) Diagram, (iv) Slope of pr is  $\frac{3}{4}$ , slope of rq is  $-\frac{4}{3}$ .  $\frac{3}{4} \cdot -\frac{4}{3} = -1 \Rightarrow \angle prq$  is a right angle.

© Theorem.

**Question 3** (a)(i)  $\angle prq = 50^\circ$ ,  $\angle opq = 40^\circ$ .

(b) Theorem. (c)(i)  $\angle ady = 130^\circ$ , (ii)  $\angle y = \angle c = 50^\circ \Rightarrow |by| = |bc|$ .

**Question 4;** (a)(i)  $x=70$ ,  $y=70$ . (b)(i) Construction. (ii) A = Rotation, B = central Symmetry, C = Axial symmetry.

©  $|qm| = 14$ ,  $|om| = 21$ ,  $\frac{\text{area}\Delta pqn}{\text{area}\Delta omn} = \frac{1/2(20)(28)\sin\theta}{1/2(30)(42)\sin\theta} = \frac{4}{9}$

**Question 5**(a)  $\frac{2}{3} = \frac{x}{9} \Rightarrow x = 6$ . (b)  $\tan A = \frac{1.6}{3} = .53333 \Rightarrow A = \text{ndf } \tan .53333 = 28^\circ$

(ii)  $\frac{x}{13} = \tan A \Rightarrow x = 13(.53333) = 7m$

© (i)  $\angle abc = 150^\circ$ ,  $\angle bac = 15^\circ$ , (ii)  $\frac{\sin 150}{x} = \frac{\sin 15}{6} \Rightarrow x = \frac{6(\sin 150)}{\sin 15} = 11.6$

**Question 6**(a):  $x = 12$ . (b)(i)

Number of seconds	0-10	10-30	30-60	60-80	80-90	90-100
Number of athletes	1	6	6	8	2	1

Mean  $= \frac{5(1) + 15(6) + 45(6) + 70(8) + 85(2) + 95(1)}{24} = \frac{1190}{24} = 49.58 = 50$

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Time	<10.00	<12.00	<14.00	<16.00	<18.00	<20.00	<22.00
CFrequency	200	500	750	1100	1900	2450	2800

(ii) Graph (iii) Approximately 700 people,

Comment An awful lot of geometry! Easier than paper 1.