Question 10

2010 HSC Mathematics

Sample 2 Start here for Question Number: 10 (a) In AABC and AACD. LCAD = L BAL (common) (aty)=AB, : AD=a Isane vatro, as a isdrawn from AB). Al is (common hence in the same vatio.) . ABC is similar to A ACD (equal included angle and Zsides in same vatio) (1) a2 = b2+c2 - 26c cosA let a = x b = a . and (= ay . ting x2 = a2 + y2 - 2ay rosx. (11) y= a (1-Loso) Sitt (iv) y= ay= a. ay = 212-az y= x2-a2 -a y= a (x2-a-1) Now ys

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Sample_2 (b) $v = \int_{a}^{b} y^{2} dx$. V for a come spline is 4 TIN3. = 4 $\int \left(r^2 - x^2\right) dx = \frac{4\pi r^3}{3}$ \$ y7: v2-x7. A of the $r^2x - \frac{x^3}{3} = 4$ V2x-73 $\left(\frac{r^2}{1}X\frac{x^3}{3}\right) = 4.$ 3122-23 1/4 total area for $\begin{bmatrix} 3r^3x-x^3\\ 12 \end{bmatrix}^n$ quarter. $\begin{bmatrix} 12\\ 12 \end{bmatrix}^n$ $= 3r^3r-r^3$ tr 3 (2-1/2 v20 1513) -314-r3 Anea of quarter = 4 TIV3 = # $= \frac{\pi v^3}{3} - area of 4POA - \frac{3}{3}$ $= \frac{1}{2} \frac{v^3}{3} - area of segment.$ Additional writing space on back page.

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Sample 2 (i) () L=v0 $V = \frac{4}{3} \pi r^{2} \qquad r = \frac{6}{1}$ 1/2 = 4 TT 13 1= 1/2 ₩2= 1/2 × 4 π 0 J $\frac{1}{2} = \frac{4}{3} \frac{1}{7} \frac{\theta}{2}$ 8π0 = 1/2 3/16 TT 0 = 3/16 TT 13 (2) You may ask for an extra Writing Booklet if you need more space to answer question 10.