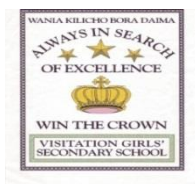


CATHOLIC DIOCESE OF MOSHI VISITATION GIRLS' SECONDARY SCHOOL



ADV MATHEMATICS FORM VI

1. (a) Find the centre and the radius of each of the circles A and B whose equations are $x^2 + y^2 - 16y + 32 = 0$, and $x^2 + y^2 - 18x + 2y + 32 = 0$
 (b) Find the coordinates of the point of contact of the circles in 2(a) above and show that the common tangent at this point of contact passes through the origin
 (c) A and B are points (3,4) and (-1,2). Find the Cartesian equation of the locus of the point $P(x, y)$ which moves so that $AP = 2BP$
2. (a) Find $\frac{dy}{dx}$ if
 - i. $e^{xy} + x + y = 1$
 - ii. $y = \log_{10} x^2$
 (b) Use Taylor's theorem to expand $\cos\left(\frac{\pi}{3} + h\right)$ in ascending powers of h as far as term h^4 . Hence evaluate i. $\cos 61^\circ$ ii. $\cos 58^\circ$ Use $1^\circ = 0.01745$ rad
3. James has two warehouses, H1 and H2 containing 1000 and 800 tons of bricks respectively. He is constructing houses of three sites A, B, and C. He needs 600 tons of bricks of A, 700 tons of B and 500 tons at C. The transport cost per ton of bricks from each warehouse to each of the three sites are as follows:-

FROM/TO	A	B	C
H1	3,000	1,500	2,000
H2	2,000	1,000	3,000

How does he send the bricks to each of the three sites at a minimum cost? What is the overall minimum cost?

4. Find
 - (a) $\int x(x^2 - 3)^5 dx$
 - (b) $\int \frac{x+1}{(x^2+2x-5)^3} dx$
 - (c) $\int_0^1 (2x - 3)((x^2 - 3x + 7)^2) dx$
 - (d) $\int_{-1}^2 \frac{x^2-1}{\sqrt{x^3-3x}} dx$

5. The following is the set of Mathematics marks of form VI students in a certain secondary school

Marks	80 – 89	70 – 79	60 – 69	50 – 59	40 - 49	30 -39
Frequency	32	43	21	11	3	1

- Find
- (a) The arithmetic mean by coding method
 - (b) The mode
 - (c) The Inter quartile range