

(2)

2. (a) Evaluate

$$\begin{vmatrix} w^6 & w^4 \\ -w^6 & w^3 \end{vmatrix}$$

where $w^3 = 1$.

2

(b) Find the inverse of the matrix

5

$$\begin{bmatrix} 1 & 1 & -1 \\ 2 & -1 & 2 \\ 1 & 3 & -2 \end{bmatrix}$$

(c) In a triangle ABC , prove that

$$\sin 2A + \sin 2B - \sin 2C = 4 \cos A \cdot \cos B \cdot \sin C$$

7

3. (a) Find the no. of terms in the expansion of

2

$$\left(x^2 - 2 + \frac{1}{x^2}\right)^6$$

(3)

(b) Find the middle term in the expansion of

5

$$\left(3x - \frac{x^3}{6}\right)^9$$

(c) Find the equation of the circle circumscribing the triangle whose sides are given by the lines

$$x = 0, y = x \text{ and } 2x + 3y = 10.$$

7

4. (a) Find the value of

$$\tan\left(\tan^{-1}\frac{1}{2} + \tan^{-1}\frac{1}{3}\right)$$

2

(b) Split into Partial Fraction

$$\frac{5x^2 - x + 3}{(x-1)(x^2+1)}$$

5

(c) If $\sin A = K \sin B$, prove that

$$\tan \frac{1}{2}(A - B) = \frac{K - 1}{K + 1} \tan \frac{1}{2}(A + B)$$

7