# Assignment-4

(1) Prove that $\cos 6\theta = 32\cos^6\theta - 48\cos^4\theta + 18\cos^2\theta - 1$.

(2) Prove that $\frac{\sin 6\theta}{\cos\theta} = 32\sin^5\theta - 32\sin^3\theta + 6\sin\theta$

(3) Prove that $\sin 7\theta = 7\sin\theta - 56\sin^3\theta + 112\sin^5\theta - 64\sin^7\theta$.

(4) Prove that $\frac{1+\cos 7\theta}{1+\cos\theta} = (x^3 - x^2 - 2x + 1)^2$ where $x = 2\cos\theta$.

(5) Expand $\cos^8\theta$ in a series of cosines of multiples of $\theta$.

(6) Prove that $32\cos^6\theta = \cos 6\theta + 6\cos 4\theta + 15\cos 2\theta + 10$.

(7) Prove that $2^6\sin^7\theta = 35\sin\theta - 21\sin 3\theta + 7\sin 5\theta - \sin 7\theta$.

(8) Prove that $\sin^8\theta = 2^{-7}[\cos 8\theta - 8\cos 6\theta + 28\cos 4\theta - 56\cos 2\theta + 35]$.

(9) Prove that $32\sin^4\theta\cos^2\theta = \cos 6\theta - 2\cos 4\theta - \cos 2\theta + 2$

(10) Prove that $\sin^5\theta\cos^2\theta = \frac{1}{64}[\sin 7\theta - 3\sin 5\theta + \sin 3\theta + 5\sin\theta]$.

(11) Prove that $2^8\cos^4\theta\sin^5\theta = \sin 9\theta - \sin 7\theta - 4\sin 5\theta + 4\sin 3\theta + 6\sin\theta$.

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|---|---|
| G-1 | 1 |
| G-2 | 2 |
| G-3 | 3 |
| G-4 | 4 |
| G-5 | 5 |
| G-6 | 6 |
| G-7 | 7 |
| G-8 | 8 |
| G-9 | 9 |
| G-10 | 10 |
| G-11 | 11 |

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