

1. Find the numerically greatest term in the expansion of $(1 + \frac{2x}{3})^{15}$, when $x = 1$.
 - (a) $\binom{15}{6}(\frac{2}{3})^6$
 - (b) $\binom{15}{7}(\frac{2}{3})^6$
 - (c) $\binom{15}{6}(\frac{2}{3})^7$
 - (d) $\binom{15}{5}(\frac{2}{3})^7$
2. In quadrilateral $ABCD$ if $\sin(\frac{A+B}{2})\cos(\frac{A-B}{2}) + \sin(\frac{C+D}{2})\cos(\frac{C-D}{2}) = 2$, then find the value of $\sin\frac{A}{2}\sin\frac{B}{2}\sin\frac{C}{2}\sin\frac{D}{2}$ is :
 - (a) $\frac{1}{2}$
 - (b) $\frac{1}{4}$
 - (c) $\frac{1}{9}$
 - (d) $\frac{1}{16}$
3. If $\sin^2\theta_1 + \sin^2\theta_2 + \sin^2\theta_3 = 0$, then which of the following is not the possible value of $\cos\theta_1 + \cos\theta_2 + \cos\theta_3$ is
 - (a) 3
 - (b) -3
 - (c) -1
 - (d) -2
4. The number of distinct solutions of equation $\sin^4x + \frac{5}{4}\cos^22x + \cos^4x + \sin^6x + \cos^6x = 2$ in the interval $[0, 2\pi]$ is :
 - (a) 4
 - (b) 5
 - (c) 6
 - (d) 8
5. If $\lim_{x \rightarrow 1} \frac{x+x^2+x^3+\dots+x^n-n}{x-1} = 45$; $n \in N$ then the value of n is equal to
 - (a) 1
 - (b) 3
 - (c) 10
 - (d) 9
6. A differentiable function satisfies the relation $f(x+y) = f(x) + f(y) + 2xy - 1 \forall x \in R$. If $f'(0) = 2$, then value of $f(2)$ is
 - (a) 1

- (b) 2
- (c) 9
- (d) 11

7. If $9^7 + 7^9$ is divisible by 2^n then the greatest value of n is

- (a) 1
- (b) 2
- (c) 6
- (d) 3

8. If $|z_1 z_2| = |2\cos\frac{\pi}{4} - 2i\sin\frac{\pi}{4}|$ and $\arg\left(\frac{z_1}{z_2}\right) = \frac{\pi}{3}$, then $z_1^2 z_2^2$ is

- (a) $2(-1 + i\sqrt{3})$
- (b) i
- (c) 2
- (d) $2(-1 - i\sqrt{3})$