GOLDEN
SAMPLE QUESTIONS

MATHEMATICS For JEE Main 2019 (Set 1)

1. The boolean expression $(p \wedge \sim q) \vee (q \vee (\sim p \wedge q))$ is equivalent to:
   (a) $\sim p \wedge q$
   (b) $p \wedge q$
   (c) $p \vee q$
   (d) $p \wedge \sim q$

2. If L_1 is the line of intersection of the planes $2x - 2y + 3z - 2 = 0$, $x - y + z + 1 = 0$ & L_2 is the line of intersection of $x + 2y - z - 3 = 0$ & $3x - y + 2z - 1 = 0$ then the distance of the origin from the plane containing the lines L_1 & L_2 is

   (a) $\dfrac{1}{2\sqrt{2}}$

   (b) $\dfrac{1}{\sqrt{2}}$

   (c) $\dfrac{1}{3\sqrt{2}}$

   (d) $\dfrac{1}{4\sqrt{2}}$

3. Let $k \in \mathbf{Z}$ s.t. the triangle with vertices $(k, -3k)$, $(5, k)$ & $(-k, 2)$ has area 28 sq. units. Then orthocentre of the triangle is:
   (a) $(2, -1/2)$
   (b) $(1, 3/4)$
   (c) $(1, -3/4)$
   (d) $(2, 1/2)$

4. If $\vec{a}$ & $\vec{b}$ are vectors such that $\left|\vec{a} + \vec{b}\right| = \sqrt{29}$ & $\vec{a} \times \left(2\hat{i} + 3\hat{j} + 4\hat{k}\right)$ $= \left(2\hat{i} + 3\hat{j} + 4\hat{k}\right) \times \vec{b}$ then a possible value of $\left(\vec{a} + \vec{b}\right).\left(-7\hat{i} + 2\hat{j} + 3\hat{k}\right)$ is

(a) 1

(b) 2

(c) 3

(d) 4

5. If a curve $y = f(x)$ passes through the point $(1, -1)$ & satisfies the differential equation $y(1 + xy)dx = x\ dy$ then $f(-1/2) =$

(a) $-2/5$

(b) $-4/5$

(c) $2/5$

(d) $4/5$