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Shift-1

EE24BTECH11063 - Y.Harsha Vardhan Reddy

SINGLE CORRECT

- 1) The acute angle between the planes P_1 and P_2 , when P_1 and P_2 are the planes passing through the intersection of the planes $5x + 8y + 13z - 29 = 0$ and $8x - 7y + z - 20 = 0$ and the points $(2, 1, 3)$ and $(0, 1, 2)$, respectively, is

- a) $\frac{\pi}{3}$ b) $\frac{\pi}{4}$ c) $\frac{\pi}{6}$ d) $\frac{\pi}{12}$

- 2) Let the plane

$$P : \vec{r} \cdot \vec{a} = d$$

contain the line of intersection of two planes $\vec{r} \cdot (\hat{i} + 3\hat{j} - \hat{k}) = 6$ and $\vec{r} \cdot (-6\hat{i} + 5\hat{j} - \hat{k}) = 7$. If the plane P passes through the point $(2, 3, \frac{1}{2})$, then the value of $\frac{13|\vec{a}|^2}{d^2}$ is equal to

- a) 90 b) 93 c) 95 d) 97

- 3) The probability, that in a randomly selected 3-digit number at least two digits are odd, is

- a) $\frac{19}{36}$ b) $\frac{15}{36}$ c) $\frac{13}{36}$ d) $\frac{23}{36}$

- 4) Let AB and PQ be two vertical poles, $160m$ apart from each other. Let C be the middle point of B and Q , which are feet of these two poles. Let $\frac{\pi}{8}$ and θ be the angles of elevation from C to P and A , respectively. If the height of pole AB , then $\tan^2 \theta$ is equal to

- a) $\frac{3-2\sqrt{2}}{2}$ b) $\frac{3+\sqrt{2}}{2}$ c) $\frac{3-2\sqrt{2}}{4}$ d) $\frac{3-\sqrt{2}}{4}$

- 5) Let p, q, r be three logical statements. Consider the compound statements

$$S_1 : ((\sim p) \vee q) \vee ((\sim p) \vee r) \text{ and}$$

$$S_2 : p \rightarrow (q \vee r)$$

Then, which of the following is NOT true?

- a) If S_2 is True, then S_1 is True
 b) If S_2 is False, then S_1 is False
 c) If S_2 is False, then S_1 is True
 d) If S_1 is False, then S_2 is False