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Shift-2

EE24BTECH11063 - Y.Harsha Vardhan Reddy

INTEGER TYPE

- 1) $\lim_{x \rightarrow 0} \frac{ax - (e^{4x} - 1)}{ax(e^{4x} - 1)}$ exists and is equal to b , then the value of $a - 2b$ is
- 2) A line is a common tangent to the circle $(x - 3)^2 + y^2 = 9$ and the parabola $y^2 = 4x$. If the two points of contact (a, b) and (c, d) are distinct and lie in the first quadrant, then $2(a + c)$ is equal to
- 3) The value of $\int_{-2}^2 |3x^2 - 3x - 6| dx$ is
- 4) If the remainder when x is divided by 4 is 3, then the remainder when $(2020 + x)^{2022}$ is divided by 8 is
- 5) A line L passing through origin is perpendicular to the lines

$$L_1 : \vec{r} = (3 + t)\hat{i} + (-1 + 2t)\hat{j} + (4 + 2t)\hat{k}$$

$$L_2 : \vec{r} = (3 + 2s)\hat{i} + (3 + 2s)\hat{j} + (2 + s)\hat{k}$$

If the co-ordinates of the point in the first octant on L_2 at the distance of $\sqrt{17}$ from the point of intersection of L and L_1 are (a, b, c) , then $18(a + b + c)$ is equal to

- 6) A function f is defined on $[-3, 3]$ as

$$f(x) = \begin{cases} \min\{|x|, 2 - x^2\}, & -2 \leq x \leq 2 \\ [x], & 2 < |x| \leq 3 \end{cases}$$

where $[x]$ denotes the greatest integer $\leq x$. The number of points, where f is not differentiable in $(-3, 3)$ is

- 7) If the curves $x = y^4$ and $xy = k$ cut at right angles, then $(4k)^6$ is equal to
- 8) The total number of two digit numbers 'n', such that $3^n + 7^n$ is a multiple of 10, is
- 9) $\vec{a} = \hat{i} + \alpha\hat{j} + 3\hat{k}$ and $\vec{b} = 3\hat{i} - \alpha\hat{j} + \hat{k}$. If the area of the parallelogram whose adjacent sides are represented by the vector \vec{a} and \vec{b} is $8\sqrt{3}$ square units, then $\vec{a} \cdot \vec{b}$ is equal to
- 10) If the curve $y = y(x)$ represented by the solution of the differential equation $(2xy^2 - y)dx + xdy = 0$, passes through the intersection of the lines, $2x - 3y = 1$ and $3x + 2y = 8$, then $|y(1)|$ is equal to