

MATHS

BOOKS - CENGAGE MATHS (ENGLISH)

LINEAR COMBINATION OF VECTORS, DEPENDENT AND INDEPENDENT VECTORS

Dpp 1 2

1. The number of integral values of p for which $(p+1)\,\hat{i}-3\hat{j}+p\hat{k},p\hat{i}+(p+1)\hat{j}-3\hat{k}$ and

 $-3\hat{i}+p\hat{j}+(p+1)\hat{k}$ are linearly dependent

vectors is q

A. 0

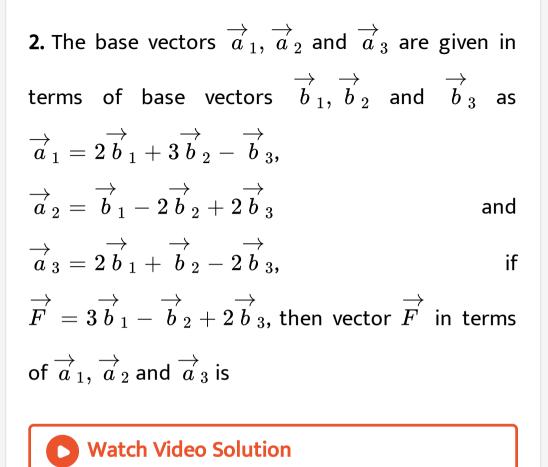
B. 1

C. 2

D. 3

Answer: B





3. The number of distinct real values of λ for which the vectors $\overrightarrow{a} = \lambda^3 \hat{i} + \hat{k}, \overrightarrow{b} = \hat{i} - \lambda^3 \hat{j}$ and $\overrightarrow{c} = \hat{i} + (2\lambda - \sin\lambda)\hat{j} - \lambda\hat{k}$ are coplanar is A. 0

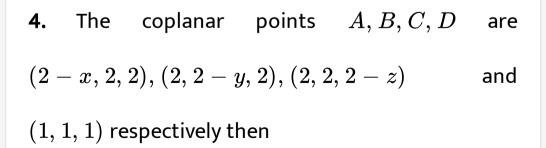
B. 1

C. 2

D. 3

Answer: A





A.
$$\frac{1}{x} + \frac{1}{y} + \frac{1}{z} = 1$$

B. $x + y + z = 1$
C. $\frac{1}{1 - x} + \frac{1}{1 - y} + \frac{1}{1 - z} = 1$

Answer: A

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D. none of these

5. If a_1 and a_2 are two values of a for which the unit vector $a\hat{i} + b\hat{j} + \frac{1}{2}\hat{k}$ is linearly dependent with $\hat{i} + 2\hat{j}$ and $\hat{j} - 2\hat{k}$, then $\frac{1}{a_1} + \frac{1}{a_2}$ is equal to

A. 1

B.
$$\frac{1}{8}$$

C. $-\frac{16}{11}$
D. $-\frac{11}{16}$

Answer: C



6. Let a,b and c be distinct non-negative numbers and the vectors $a\hat{i} + a\hat{j} + c\hat{k}$, $\hat{i} + \hat{k}$, $c\hat{i} + c\hat{j} + b\hat{k}$ lie in a plane, then the quadratic equation $ax^2 + 2cx + b = 0$ has A. real and equal roots

B. real unequal roots

C. unreal roots

D. both roots real and positive

Answer: A

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7. In the $\triangle OAB$, M is the mid-point of AB,C is a point on OM, such that 2OC=CM. X is a point on the side OB such that OX=2XB. The line XC is produced to meet OA in Y. then, $\frac{OY}{YA}$ is equal to

A.
$$\frac{1}{3}$$

B. $\frac{2}{7}$
C. $\frac{3}{2}$
D. $\frac{2}{5}$

Answer: B



8. Points X and Y are taken on the sides QR and RS, respectively of a parallelogram PQRS, so that QX=4XR and RY=4YS. The line XY cuts the line PR at Z. Then, PZ is

A.
$$\frac{21}{25}\overrightarrow{PR}$$

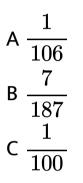
B. $\frac{16}{25}\overrightarrow{PR}$
C. $\frac{17}{25}\overrightarrow{PR}$

D. None of these

Answer: A

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9. On the xy plane where O is the origin, given points, A(1,0), B(0,1) and C(1,1). Let P, Q, and R be moving points on the line OA, OB, OC respectively such that $\overline{OP} = 45t\overline{(OA)}, \overline{OQ} = 60t\overline{(OB)}, \overline{OR} = (1-t)\overline{(OC)}$ with t > 0. If the three points P, Q and R are collinear then the value of t is equal to



D none of these

A.
$$\frac{1}{106}$$

B. $\frac{7}{187}$
C. $\frac{1}{100}$

D. none of these

Answer: B



10. Given three vectors \overrightarrow{a} , \overrightarrow{b} and \overrightarrow{c} are non-zero and non-coplanar vectors. Then which of the following are coplanar.

A.
$$\overrightarrow{a} + \overrightarrow{b}$$
, $\overrightarrow{b} + \overrightarrow{c}$, $\overrightarrow{c} + \overrightarrow{a}$
B. $\overrightarrow{a} - \overrightarrow{b}$, $\overrightarrow{b} + \overrightarrow{c}$, $\overrightarrow{c} + \overrightarrow{a}$
C. $\overrightarrow{a} + \overrightarrow{b}$, $\overrightarrow{b} - \overrightarrow{c}$, $\overrightarrow{c} - \overrightarrow{a}$
D. $\overrightarrow{a} + \overrightarrow{b}$, $\overrightarrow{b} + \overrightarrow{c}$, $\overrightarrow{c} - \overrightarrow{a}$

Answer: B::D

