

# CLASS 12 PRE-BOARDS SPECIAL

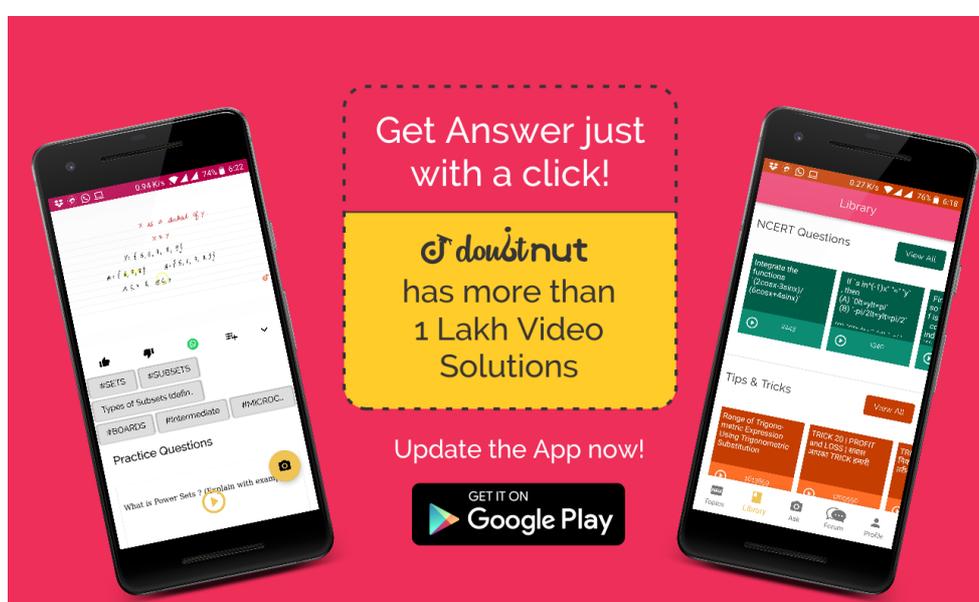


## Chapter 4. Determinants

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Ques No.	Question
1	<p><b>CLASS 12 PRE-BOARDS SPECIAL - Chapter 4. Determinants</b></p> <p>Using the properties of determinants, prove the following <math>\begin{vmatrix} 1 &amp; bc &amp; bc(b+c) \\ 1 &amp; ca &amp; ca(c+a) \\ 1 &amp; ab &amp; ab(a+b) \end{vmatrix}</math></p> <p><a href="#">Watch Free Video Solution on Doubtnut</a></p>
2	<p><b>CLASS 12 PRE-BOARDS SPECIAL - Chapter 4. Determinants</b></p> <p>Using properties of determinants, prove the following <math>\begin{vmatrix} 3a &amp; -a+b &amp; -a+c \\ a-b &amp; 3b &amp; c-a \\ a-c &amp; b-c &amp; 3c \end{vmatrix} = 3(a+b+c)(ab+bc+ca)</math></p> <p><a href="#">Watch Free Video Solution on Doubtnut</a></p>
3	<p><b>CLASS 12 PRE-BOARDS SPECIAL - Chapter 4. Determinants</b></p> <p>Using the properties of determinants, prove that following <math>\begin{vmatrix} a-b &amp; -c^2 &amp; a^2 \\ a^2 &amp; -c &amp; -a^2 \\ b^2 &amp; c^2 &amp; -a-b \end{vmatrix} = (a+b+c)^3</math></p> <p><a href="#">Watch Free Video Solution on Doubtnut</a></p>





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4 Using properties of determinants, prove that following

$$\begin{vmatrix} a+b+2c & a & b \\ c & b+c+2a & b \\ c & a & c+a+2b \end{vmatrix} = 2(a+b+c)^3$$

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5 Using properties of determinants, prove the following

$$\begin{vmatrix} \alpha & \beta & \gamma \\ \alpha^2 & \beta^2 & \gamma^2 \\ \beta + \gamma & \gamma + \alpha & \alpha + \beta \end{vmatrix} = (\alpha - \beta)(\beta - \gamma)(\gamma - \alpha)(\alpha + \beta + \gamma)$$

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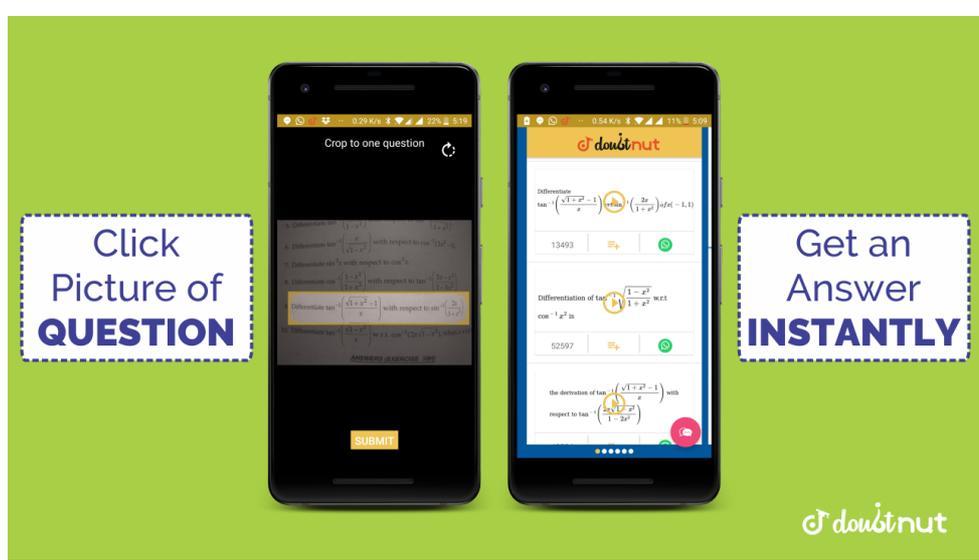
6 Evaluate  $\begin{vmatrix} a+ib & c+id \\ -c+id & a-ib \end{vmatrix}$

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7 Find the cofactor of  $a_{12}$  in the following  $\begin{vmatrix} 2 & -3 & 5 \\ 6 & 0 & 4 \\ 1 & 5 & -7 \end{vmatrix}$

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What positive value of  $x$  makes the following pair of determinants equal?

$$\begin{vmatrix} 2x & 3 \\ 5 & x \end{vmatrix}, \begin{vmatrix} 16 & 3 \\ 5 & 2 \end{vmatrix}$$

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Using properties of determinants, prove that

$$\begin{vmatrix} b+c & q+r & y+z \\ c+a & r+p & z+x \\ c+b & p+q & x+y \end{vmatrix} = 2 \begin{vmatrix} a & p & x \\ b & q & y \\ c & r & z \end{vmatrix}$$

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If  $\begin{vmatrix} x+1 & x-1 \\ x-3 & x+2 \end{vmatrix} = \begin{vmatrix} 4 & -1 \\ 1 & 3 \end{vmatrix}$ , then write the value of  $x$ .

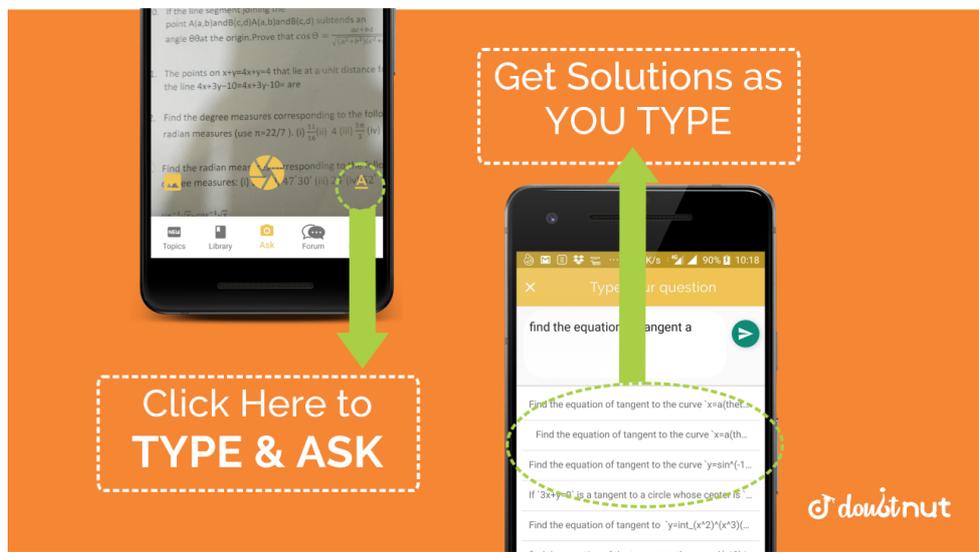
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If  $A_{ij}$  is the cofactor of the element  $a_{ij}$  of the determinant  $\begin{vmatrix} 2 & -3 & 5 \\ 6 & 0 & 4 \\ 1 & 5 & -7 \end{vmatrix}$ , then write the value of  $a_{32} \cdot A_{32}$ .

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12 By using properties of determinants, prove the following

$$\begin{vmatrix} x+4 & 2x & 2x \\ 2x & x+4 & 2x \\ 2x & 2x & x+4 \end{vmatrix} = (5x+4)(4-x)^2$$

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13 Using properties of determinants, prove the following

$$\begin{vmatrix} a^2 & ab & ac \\ ab & b^2+1 & bc \\ ca & cb & c^2+1 \end{vmatrix} = 1+a^2+b^2+c^2.$$

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14 Write the value of the following determinant

$$\begin{vmatrix} a-b & b-c & c-a \\ b-c & c-a & a-b \\ c-a & a-b & b-c \end{vmatrix}$$

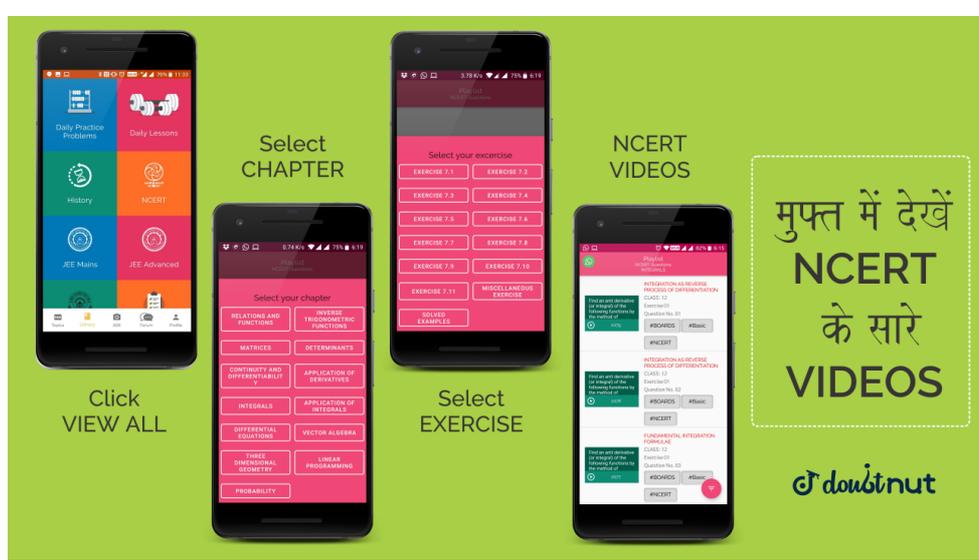
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15 Find the value of x, from the following:

$$\begin{vmatrix} x & 4 \\ 2 & 2x \end{vmatrix} = 0$$

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Using properties of determinants, show that 
$$\begin{vmatrix} b+a & a & a \\ b & c+a & b \\ c & c & a+b \end{vmatrix} = 4abc$$

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What is the value of the determinant 
$$\begin{vmatrix} 0 & 2 & 0 \\ 2 & 3 & 4 \\ 4 & 5 & 6 \end{vmatrix} ?$$

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Using properties of determinants, prove the following:

$$\begin{vmatrix} x & x^2 & px^2 \\ y & y^2 & py^2 \\ z & z^2 & pz^2 \end{vmatrix} = (1 + pxyz)(x - y)(z - x)$$

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Using properties of determinants, prove the following 
$$\begin{vmatrix} x & x+y & x+2y \\ x+2y & x & x+y \\ x+y & x+2y & x \end{vmatrix} = 9y^2(x+y)$$

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Prove that the determinant  $\begin{vmatrix} x & \sin \theta & \cos \theta \\ -\sin \theta & -x & 1 \\ \cos \theta & 1 & x \end{vmatrix}$  is independent of  $\theta$

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Without expanding, prove that  $\Delta = \begin{vmatrix} x+y & y+z & z+x \\ z & x & y \\ 1 & 1 & 1 \end{vmatrix} = 0$

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Using properties of determinants, prove that  $\begin{vmatrix} -a^2 & ab & ac \\ ba & -b^2 & bc \\ ca & cb & -c^2 \end{vmatrix} = 4a^2b^2c^2$

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Using properties of determinants, show that ABC is isosceles if  $\begin{vmatrix} 1 & 1 & 1 \\ 1 + \cos A & 1 + \cos B & 1 + \cos C \\ \cos^2 A + \cos A & \cos^2 B + \cos B & \cos^2 C + \cos C \end{vmatrix} = 0$

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If  $\begin{vmatrix} x^3 + 1 & x^2 & x \\ y^3 + 1 & y^2 & y \\ z^3 + 1 & z^2 & z \end{vmatrix} = 0$  and  $x, y, z$  are all different then prove that  $xyz = -1$

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Prove that  $\begin{vmatrix} x & x^2 & 1 + px^3 \\ y & y^2 & 1 + py^3 \\ z & z^2 & 1 + pz^3 \end{vmatrix} = (1 + pxyz)(x - y)(y - z)(z - x)$

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Prove that  $\begin{vmatrix} (b + c)^2 & a^2 & a^2 \\ b^2 & (c + a)^2 & b^2 \\ c^2 & c^2 & (a + b)^2 \end{vmatrix} = 2abc(a + b + c)^3$

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