



MATHS

BOOKS - PATHFINDER MATHS (BENGALI ENGLISH)

DETERMINATES

Question Bank

1. If $\begin{vmatrix} x - 2 & -3 \\ 3x & 2x \end{vmatrix} = 3$, Find the integral value of x .



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2. Without expanding, show that $\begin{vmatrix} x + 1 & x + 2 & x + a \\ x + 2 & x + 3 & x + b \\ x + 3 & x + 4 & x + c \end{vmatrix} = 0$, Where a, b, c

are in A.P



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3. Solve for x: $\begin{vmatrix} x & 3 \\ 5 & 2x \end{vmatrix} = \begin{vmatrix} x & -4 \\ 5 & 3 \end{vmatrix}$

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4. Evaluate $\begin{vmatrix} 1 & \omega & \omega^2 \\ \omega^2 & 1 & \omega \\ \omega^2 & \omega & 1 \end{vmatrix}$ where ω is an imaginary cube root of unity.

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5. Using determinant find the area of the triangle formed by joining the points $(-3,-5)$, $(5,2)$ and $(-9,-3)$.

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6. If $x+y+z=0$ then show that $\begin{vmatrix} 1 & 1 & 1 \\ x & y & z \\ x^3 & y^3 & z^3 \end{vmatrix} = 0$.

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7. Evaluate the following determinant

$$\begin{vmatrix} x + \lambda & x & x \\ x & x + \lambda & x \\ x & x & x + \lambda \end{vmatrix}$$

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8. Without expanding prove that,

$$\begin{vmatrix} 1 & ab & \frac{1}{a} + \frac{1}{b} \\ 1 & bc & \frac{1}{b} + \frac{1}{c} \\ 1 & ca & \frac{1}{c} + \frac{1}{a} \end{vmatrix} = 0$$

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9. Show that

$$\begin{vmatrix} a & b & c \\ a - b & b - c & c - a \\ b + c & c + a & a + b \end{vmatrix} = a^3 + b^3 + c^3 - 3abc.$$

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10. If a, b, c (all positive) are the p th, q th and r th terms respectively of a

geometric progression, show that
$$\begin{vmatrix} \log a & p & 1 \\ \log b & q & 1 \\ \log c & r & 1 \end{vmatrix} = 0.$$

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11. If $p \pm a, q \pm b, r \pm c$ and
$$\begin{vmatrix} p & b & c \\ a & q & c \\ a & b & r \end{vmatrix} = 0$$
 show that

$$\frac{p}{p-a} + \frac{q}{q-b} + \frac{r}{r-c} = 2.$$

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12. find the value of $:- (101)^2$

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13. Given that $x = -9$ is a root of
$$\begin{vmatrix} x & 3 & 7 \\ 2 & x & 2 \\ 7 & 6 & x \end{vmatrix} = 0.$$
 Find the other roots.



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14. Show that

$$\begin{vmatrix} (a-x)^2 & (a-y)^2 & (a-z)^2 \\ (b-x)^2 & (b-y)^2 & (b-z)^2 \\ (c-x)^2 & (c-y)^2 & (c-z)^2 \end{vmatrix} = 2(a-b)(b-c)(c-a)(x-y)(y-z)(z-x)$$



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15. Find the ratio in which the line joining the pts $(-3,4,8)$ and $(5,-6,4)$ is divided by the xy plane



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16. Show that:

$$\begin{vmatrix} (b+c)^2 & a^2 & bc \\ (c+a)^2 & b^2 & ca \\ (a+b)^2 & c^2 & ab \end{vmatrix} = (a^2 + b^2 + c^2)(a+b+c)(b-c)(c-a)(a-b)$$



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17. If A,B,C be the angles of a triangle, then prove that ,

$$\begin{vmatrix} -1 & \cos C & \cos B \\ \cos C & -1 & \cos A \\ \cos B & \cos A & -1 \end{vmatrix} = 0$$

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18. $\int \frac{\sin x}{1 + \cos x} dx = ?$

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19. If x,y,z are all distinct and if $\begin{vmatrix} x & x^2 & 1 + x^3 \\ y & y^2 & 1 + y^3 \\ z & z^2 & 1 + z^3 \end{vmatrix} = 0$, show that $xyz + 1 = 0$

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

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21. 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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