

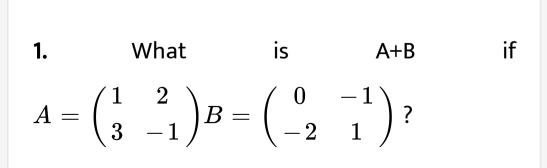
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# MATHS

# **BOOKS - MODERN PUBLICATION**

# MATRICES







2. Give an example of a unit matrix.

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# **3.** Express A = ((1,2),(2,3) as the sum of a

#### symmetric and a skew symmetric matrix.

$$igg((x_1,x_2),igg((y_1,y_2)-igg(egin{array}{cc} 2&3\ 0&1 \end{pmatrix},\ =igg(egin{array}{cc} 3&5\ 1&2 \end{pmatrix}$$

If

then find  $x_1, x_2, y_1, y_2$ ,

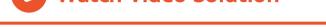
4.



### 5. Construct a 2 x 3 matrix having elements

defined by  $a_{ij} = i - j$ .



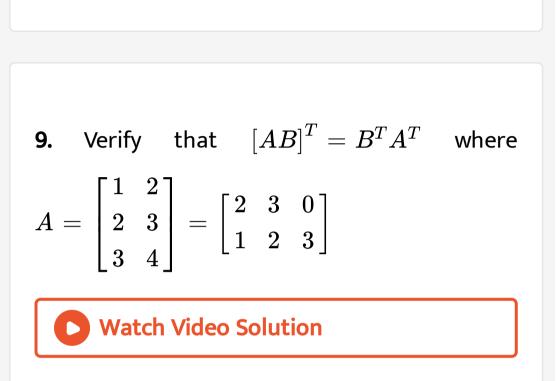


7. If 
$$A = ((3, 0, 0), (0.3, 0)(0, 0, 3)$$
 then find

A^2.

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**8.** Can a matrix be constructed by taking 29 elements?



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**10.** There are two families A and B. There are 4 men, 6 women and 2 children in family A and 2 men, 2 women and 4 children in family B. The recommended daily amount of calories is 2400 for men, 1900 for women and 1800 for children, and 45 g of proteins for men, 55 g for women and 33 g for children. Represent the above information by matrices. Using matrices multiplication, calculate the total requirement of calories and proteins for each of the 2 families.

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**11.** A trust fund has Rs. 50,000 that is to be invested in two types of bonds .The first and

second bonds respectively pay annual interest at the rate of 5 % and 6 % respectively .Using matrix multiplication , determine how to invest the money in these bonds so as to get a total annual interest of Rs. 2780 .

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12. Prove that a unit matrix is its own inverse.

Is the converse true ?

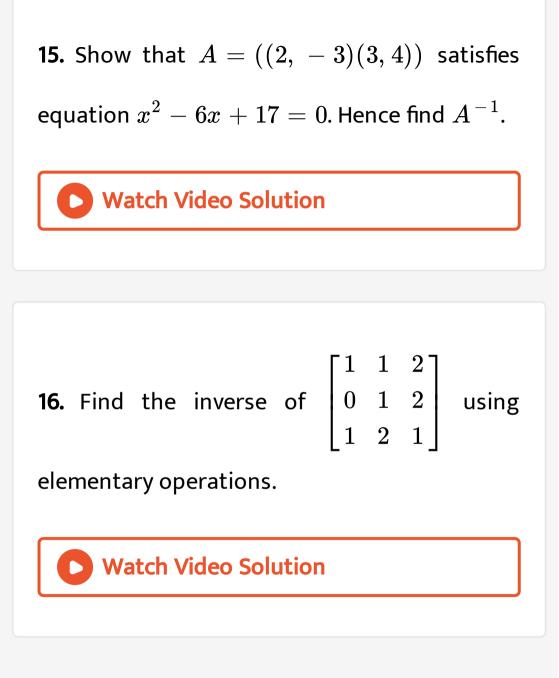
13. Express as a sum of a symmetric and skew

symmetric matrix. 
$$\begin{bmatrix} 2 & -1 & 3 \\ 5 & 7 & -2 \\ 1 & 4 & 6 \end{bmatrix}$$

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14. Express as a sum of a symmetric and skew

	$\int x$	a	b
symmetric matrix.	a	y	c
	b	С	z



17. If 
$$A = \begin{pmatrix} \cos x & \sin x \\ -\sin x & \cos x \end{pmatrix}$$
 then prove that  $A^n = ((\cos nx, \sin nx), (-\sin nx, \cos nx))$ 

for all positive integers n.

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**18.** If 
$$A = \begin{bmatrix} 0 & -\tan\left(\frac{\alpha}{2}\right) \\ \tan\left(\frac{\alpha}{2}\right) & 0 \end{bmatrix}$$
 show that  
 $(I+A) = (I-A) \begin{bmatrix} \cos \alpha & -\sin \alpha \\ \sin \alpha & \cos \alpha \end{bmatrix}$  where  
 $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ 

