

PreCalc Ch8 WS

Name:

$$A = \begin{bmatrix} 1 & 1 & 3 \\ -2 & 3 & 2 \end{bmatrix}$$

$$B = \begin{bmatrix} -1 & 1 & 2 \\ 2 & 4 & 3 \end{bmatrix}$$

$$C = \begin{bmatrix} 2 & 1 \\ 1 & 3 \\ -1 & 2 \end{bmatrix}$$

1. $AC =$

2. $A - B =$

3. Consider matrix A . What result if $R_1 = -2r_2 + r_1$?

4. Multiply

$$\begin{bmatrix} 4 & 1 \\ 6 & 2 \end{bmatrix} \begin{bmatrix} 1 & -\frac{1}{2} \\ -3 & 2 \end{bmatrix}$$

Did you get the identity matrix? Good! That's because

$$\begin{bmatrix} 1 & -\frac{1}{2} \\ -3 & 2 \end{bmatrix}$$

is the inverse matrix of

$$\begin{bmatrix} 4 & 1 \\ 6 & 2 \end{bmatrix}$$

5. Multiply

$$\begin{bmatrix} 1 & -\frac{1}{2} \\ -3 & 2 \end{bmatrix} \begin{bmatrix} 10 \\ 14 \end{bmatrix}$$

Did you get a matrix that matched the answer you found in question 5, parts (d) and (e)? Good! We can solve a system of equations by multiplying the inverse matrix to the answer column.

6. This is how to find the inverse of

$$\begin{bmatrix} 4 & 1 \\ 6 & 2 \end{bmatrix}$$

(a) swap the top left with the bottom right:

$$\begin{bmatrix} 2 & 1 \\ 6 & 4 \end{bmatrix}$$

(b) change the sign of the top right and bottom left:

$$\begin{bmatrix} 2 & -1 \\ -6 & 4 \end{bmatrix}$$

(c) now multiply by the reciprocal of the determinate (Since the determinate of the original matrix is 2, we multiply by $1/2$):

$$\frac{1}{2} \begin{bmatrix} 2 & -1 \\ -6 & 4 \end{bmatrix} = \begin{bmatrix} 1 & -\frac{1}{2} \\ -3 & 2 \end{bmatrix}$$

7. Follow the 3 steps of number 6 to find the inverse

of $\begin{bmatrix} 2 & 5 \\ 3 & 8 \end{bmatrix}$

11. Find the determinant :

$$\begin{vmatrix} 1 & 1 \\ 2 & 1 \end{vmatrix}$$

8. Now Solve

$$2x + 5y = 9$$

$$3x + 8y = 4$$

by multiplying the inverse matrix you found in question 9 with $\begin{bmatrix} 9 \\ 4 \end{bmatrix}$

12. Find the determinant :

$$\begin{vmatrix} 1 & 0 \\ 3 & 2 \end{vmatrix}$$

9. Solve by any method (Yes, your calculator can tell you the inverse of matrix A by typing $[A]^{-1}$)

$$4x - 6y - 12z = -11$$

$$12x + 9y - 4z = 9$$

$$3x + 3y - 6z = -1$$

13. Find the determinant :

$$\begin{vmatrix} 2 & 1 \\ 6 & 3 \end{vmatrix}$$

10. There are 200 marbles in a bag, some are blue and some are red. The blue balls weigh 2 oz. each, while the red balls weigh 2.5 oz. each. If the total weighs 29.25 pounds (468 oz), how many red balls are there?

14. Find the determinant :

$$\begin{vmatrix} 1 & 1 & 1 \\ 2 & 1 & 3 \\ -1 & 0 & 2 \end{vmatrix}$$

15. Solve for x :

$$\begin{vmatrix} 1 & 1 & 0 \\ x & 1 & 1 \\ 1 & 0 & 1 \end{vmatrix} = 3$$