

1. b) Consider the following. Find the values of the resulting matrix, when the following elementary row operations are applied in the given order.

b) Consider the following. Find the values of the resulting matrix, when the following elementary row operations are applied in the given order.

$$\begin{bmatrix} 1 & -2 & 3 & 1 & 0 & 0 \\ -2 & 1 & -2 & 0 & 1 & 0 \\ 3 & -3 & 7 & 0 & 0 & 1 \end{bmatrix} \rightarrow \begin{bmatrix} a & b & c & j & k & l \\ d & e & f & m & n & o \\ g & h & i & p & q & r \end{bmatrix}$$

1.  $r'_2 = r_2 + 2r_1$   
2.  $r'_3 = r_3 - 3r_1$   
3.  $r'_3 = r_3 + r_2$   
4.  $r'_3 = r_3 \times \frac{1}{2}$   
5.  $r'_2 = r_2 - 4r_3$   
6.  $r'_2 = r_2 \times -\frac{1}{3}$   
7.  $r'_1 = r_1 - 3r_3$

$a =$        $b =$        $c =$   
 $d =$        $e =$        $f =$   
 $g =$        $h =$        $i =$   
 $j =$        $k =$        $l =$   
 $m =$        $n =$        $o =$

$\begin{bmatrix} 1 & -2 & 3 & 1 & 0 & 0 \\ 0 & -3 & 4 & 2 & 1 & 0 \\ 3 & -3 & 7 & 0 & 0 & 1 \end{bmatrix}$   
 $\begin{bmatrix} 1 & -2 & 3 & 1 & 0 & 0 \\ 0 & -3 & 4 & 2 & 1 & 0 \\ 0 & 3 & -2 & -3 & 0 & 1 \end{bmatrix}$   
 $\begin{bmatrix} 1 & -2 & 3 & 1 & 0 & 0 \\ 0 & -3 & 4 & 2 & 1 & 0 \\ 0 & 0 & 2 & -1 & 1 & 1 \end{bmatrix}$   
 $\begin{bmatrix} 1 & -2 & 3 & 1 & 0 & 0 \\ 0 & -3 & 4 & 2 & 1 & 0 \\ 0 & 0 & 1 & -1/2 & 1/2 & 1/2 \end{bmatrix}$   
 $\begin{bmatrix} 1 & -2 & 3 & 1 & 0 & 0 \\ 0 & -3 & 0 & 2 & -1 & -2 \\ 0 & 0 & 1 & -1/2 & 1/2 & 1/2 \end{bmatrix}$   
 $\begin{bmatrix} 1 & -2 & 3 & 1 & 0 & 0 \\ 0 & 1 & 0 & -2/3 & 1/3 & 2/3 \\ 0 & 0 & 1 & -1/2 & 1/2 & 1/2 \end{bmatrix}$   
 $\begin{bmatrix} 1 & -2 & 0 & -1/2 & 3/2 & -3/2 \\ 0 & 1 & 0 & -2/3 & 1/3 & 2/3 \\ 0 & 0 & 1 & -1/2 & 1/2 & 1/2 \end{bmatrix}$

2. Let  $A = \begin{bmatrix} 5 & -2 & 1 \\ 4 & 1 & 0 \\ 1 & -2 & 2 \end{bmatrix}$  and  $B=3A$ ;  $C=B+2A-5I$ . Find matrix D such that  $D= 2A+B-C$

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Let  $A = \begin{bmatrix} 5 & -2 & 1 \\ 4 & 1 & 0 \\ 1 & -2 & 2 \end{bmatrix}$

and  $B=3A$ ;  $C=B+2A-5I$ . Find matrix D such that  $D=2A+B-C$ .

Assume I is the identity matrix.

$D = \begin{bmatrix} a & b & c \\ d & e & f \\ g & h & i \end{bmatrix}$

$D = 2A + 3A - (3A + 2A - 5I)$   
 $D = 5I$

$a = :$    
 $b = :$    
 $c = :$    
 $d = :$    
 $e = :$    
 $f = :$    
 $g = :$    
 $h = :$    
 $i = :$

$\begin{bmatrix} 5 & 0 & 0 \\ 0 & 5 & 0 \\ 0 & 0 & 5 \end{bmatrix}$

3. Let  $A = \begin{bmatrix} 5 & -5 & 4 \\ 0 & 3 & 2 \\ 1 & 0 & 7 \end{bmatrix}$  and  $B=3A$ ;  $C=B+2A-5I$ . Find matrix D such that  $D=2A+B-C$

Let  $A = \begin{bmatrix} 5 & -5 & 4 \\ 0 & 3 & 2 \\ 1 & 0 & 7 \end{bmatrix}$

and  $B=3A$ ;  $C=B+2A-5I$ . Find matrix D such that  $D=2A+B-C$ .

Assume I is the identity matrix.

$D = \begin{bmatrix} a & b & c \\ d & e & f \\ g & h & i \end{bmatrix}$

$a = : \text{ } \square$

$b = : \text{ } \square$

$c = : \text{ } \square$

$d = : \text{ } \square$

$e = : \text{ } \square$

$f = : \text{ } \square$

$g = : \text{ } \square$

$h = : \text{ } \square$

$i = : \text{ } \square$

5i

4. Let  $A = \begin{bmatrix} 1 & 2 \\ 3 & 0 \end{bmatrix}$  Find  $B = A^2 - 3A + 2I$

Let  $A = \begin{bmatrix} 1 & 2 \\ 3 & 0 \end{bmatrix}$

Find  $B = A^2 - 3A + 2I$

$B = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$

$a = : \text{ } \square$

$b = : \text{ } \square$

$c = : \text{ } \square$

$d = : \text{ } \square$

$A.A = \begin{bmatrix} 7 & 2 \\ 3 & 6 \end{bmatrix}$

$-3A = \begin{bmatrix} -3 & -6 \\ -9 & 0 \end{bmatrix}$

$2I = \begin{bmatrix} 2 & 0 \\ 0 & 2 \end{bmatrix}$

5. Let  $A = \begin{bmatrix} 0 & 1 \\ -1 & 5 \end{bmatrix}$  Find  $B = A^2 - 3A + 2I$

Let  $A = \begin{bmatrix} 0 & 1 \\ -1 & 5 \end{bmatrix}$

Find  $B = A^2 - 3A + 2I$

$B = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$

a = :

b = :

c = :

d = :

$A.A = \begin{bmatrix} -1 & 5 \\ -5 & 24 \end{bmatrix}$

$-3A = \begin{bmatrix} 0 & -3 \\ 3 & -15 \end{bmatrix}$

$2i = \begin{bmatrix} 2 & 0 \\ 0 & 2 \end{bmatrix}$

$B = \begin{bmatrix} 1 & 2 \\ -2 & 11 \end{bmatrix}$

6. Let  $A = \begin{bmatrix} 5 & 2 \\ -1 & 0 \end{bmatrix}$  Find  $B = A^2 - 3A + 2I$

**Question 11**  
Not yet answered  
Marked out of 4.00  
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Let  $A = \begin{bmatrix} 5 & 2 \\ -1 & 0 \end{bmatrix}$

Find  $B = A^2 - 3A + 2I$

$B = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$

a = :

b = :

c = :

d = :

$A.A = \begin{bmatrix} 23 & 10 \\ -5 & -2 \end{bmatrix}$

$-3A = \begin{bmatrix} -15 & -6 \\ 3 & 0 \end{bmatrix}$

$2i = \begin{bmatrix} 2 & 0 \\ 0 & 2 \end{bmatrix}$

$B = \begin{bmatrix} 10 & 4 \\ -2 & 0 \end{bmatrix}$

Let  $A = \begin{bmatrix} 5 & -2 & 1 \\ 4 & 1 & 0 \\ 1 & -2 & 2 \end{bmatrix}$

and  $B=3A$ ;  $C=B+2A-5I$ . Find matrix D such that  $D=2A+B-C$ .

Assume I is the identity matrix.

$D = \begin{bmatrix} a & b & c \\ d & e & f \\ g & h & i \end{bmatrix}$  5i

a = :

b = :

c = :

d = :

e = :

f = :

g = :

h = :

i = :



7. Sum of the two digits of a two-digit number is 15. When the sum of two and twice the ten digit is divided by 2 gives the unit digit. Write down 2 equations to find the unit digit (Y) and tens digit (X)

Sum of the two digits of a two-digit number is 15. When the sum of two and twice the tens digit is divided by 2 gives the unit digit. Write down 2 equations to find the unit digit (Y) and tens digit (X).

(Hint: For 34, 3 is the tens digit and 4 is the unit digit)

\* X +  \* Y =

\* X +  \* Y =

a) Write the above 2 equations in matrix form  $Ax = b$ . (According to the given order).

$Ax = b$

$A = \begin{bmatrix} p & q \\ r & s \end{bmatrix}$   $x = \begin{bmatrix} t \\ u \end{bmatrix}$   $b = \begin{bmatrix} c \\ d \end{bmatrix}$

$$A = \begin{bmatrix} p & q \\ r & s \end{bmatrix} \quad x = \begin{bmatrix} t \\ u \end{bmatrix} \quad b = \begin{bmatrix} c \\ d \end{bmatrix}$$

Module

$A = \begin{bmatrix} p & q \\ r & s \end{bmatrix}$   $x = \begin{bmatrix} t \\ u \end{bmatrix}$   $b = \begin{bmatrix} c \\ d \end{bmatrix}$

$p = \text{c-quar}$   $q = \text{c-quar}$

$r = \text{d-quar}$   $s = \text{d-quar}$

$C = \begin{bmatrix} c1 & c2 \\ c3 & c4 \end{bmatrix}$

$d = \text{rt+su}$

b) Find the cofactor matrix(C) of A.

$C = \begin{bmatrix} a1 & a2 \\ a3 & a4 \end{bmatrix}$

a1 =  a2 =

a3 =  a4 =

c) Find the determinant of A :

d) Find the adjoint of A.

$adj A = \begin{bmatrix} p & q \\ r & s \end{bmatrix}$

p =  q =

r =  s =

d) Find the inverse of A and hence find the price of an adult ticket and

Cost of an adult ticket =

Cost of a child ticket =

8. If  $|A|=43$  then find the cofactor matrix of A.

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If  $|A| = 43$  then find the cofactor matrix of A.

$A = \begin{bmatrix} 1 & 2 & 7 \\ 4 & -3 & x \\ 2 & 2 & 5 \end{bmatrix}$   $x = 0$

$C_{11}$

$C_{12}$

$C_{13}$

$C_{21}$

$C_{22}$

$C_{23}$

$C = \begin{bmatrix} -15 & -20 & 14 \\ 4 & -9 & 2 \\ 21 & 28 & -11 \end{bmatrix}$

9. If  $|A| = 128$  then find the cofactor matrix of A.

If  $|A| = 128$  then find the cofactor matrix of A.

$$A = \begin{bmatrix} x & 5 & 7 \\ 2 & 4 & 1 \\ -2 & 8 & 3 \end{bmatrix}$$

$C_{11}$  
  
 $C_{12}$  
  
 $C_{13}$  
  
 $C_{21}$  
  
 $C_{22}$

10. Let  $A = \begin{bmatrix} 7 & 2 & 0 \\ 1 & 3 & -1 \\ 3 & 2 & 5 \end{bmatrix}$  Find  $B = 3A$ ;  $C = B + 2A - 5I$ . Find matrix D such that  $D = 2A + B - C$ .

Question 1  
Not yet answered  
Marked out of 9.00  
Flag question

Let  $A = \begin{bmatrix} 7 & 2 & 0 \\ 1 & 3 & -1 \\ 3 & 2 & 5 \end{bmatrix}$

and  $B = 3A$ ;  $C = B + 2A - 5I$ . Find matrix D such that  $D = 2A + B - C$ .  
Assume I is the identity matrix.

$$D = \begin{bmatrix} a & b & c \\ d & e & f \\ g & h & i \end{bmatrix}$$

$a =$    
 $b =$    
 $c =$    
 $d =$    
 $e =$    
 $f =$    
 $g =$    
 $h =$    
 $i =$

11. b) Find the determinant of A. :  
c) Find x using the cramer's rule.

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c) Find x using the cramer's rule.

$$x = \frac{|A_1|}{|A|}, A_1 = \begin{bmatrix} a & b & c \\ d & e & f \\ g & h & i \end{bmatrix}$$

a = :  b = :  c = :   
d = :  e = :  f = :   
g = :  h = :  i = :   
|A| = :   
x = :

d) Find y using the cramer's rule.

$$y = \frac{|A_2|}{|A|}, A_2 = \begin{bmatrix} a & b & c \\ d & e & f \\ g & h & i \end{bmatrix}$$

a = :  b = :  c = :   
d = :  e = :  f = :

12. Consider the following linear system of equations.

$$2x + y - 3z = 1$$

$$3y - 2z = -1$$

$$3x + y - z = 8$$

15  
answered  
out of  
question

Consider the following linear system of equations.  
 $2x + y - 3z = 1$   
 $3y - 2z = -1$   
 $3x + y - z = 8$        $|A| = 19$

a) Represent the above system of linear equations in matrix form  $Ax = b$ .

$$A = \begin{bmatrix} a & b & c \\ d & e & f \\ g & h & i \end{bmatrix}, x = \begin{bmatrix} x \\ y \\ z \end{bmatrix}, b = \begin{bmatrix} p \\ q \\ r \end{bmatrix}$$

a = :  b = :  c = :   
d = :  e = :  f = :   
g = :  h = :  i = :   
p = :   
q = :

$$\begin{bmatrix} 2 & 1 & -3 \\ 0 & 3 & -2 \\ 3 & 1 & -1 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 1 \\ -1 \\ 8 \end{bmatrix}$$



13. Consider the following linear system of equations.

$$x+2y-2z=2$$

$$2x+y-z=-2$$

$$3x+2y-z=-1$$

Question 12

Not yet answered

Marked out of 63.00

Flag question

Consider the following linear system of equations.

$$x + 2y - 2z = 2$$

$$2x + y - z = -2$$

$$3x + 2y - z = -1$$

1. Write down the augmented matrix for the above system of linear equations and reduce that to echelon form.

$$\begin{bmatrix} a & b & c & p \\ d & e & f & q \\ g & h & i & r \end{bmatrix} \rightarrow \begin{bmatrix} a1 & b1 & c1 & p1 \\ d1 & e1 & f1 & q1 \\ g1 & h1 & i1 & r1 \end{bmatrix} \rightarrow \begin{bmatrix} a2 & b2 & c2 & p2 \\ d2 & e2 & f2 & q2 \\ g2 & h2 & i2 & r2 \end{bmatrix} \rightarrow \begin{bmatrix} a3 & b3 & c3 & p3 \\ d3 & e3 & f3 & q3 \\ g3 & h3 & i3 & r3 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 2 & -2 & 2 \\ 2 & 1 & -1 & -2 \\ 3 & 2 & -1 & -1 \end{bmatrix} \rightarrow \begin{bmatrix} 1 & 2 & -2 & 2 \\ 0 & -3 & 3 & -6 \\ 0 & -4 & 5 & -7 \end{bmatrix} \rightarrow \begin{bmatrix} 1 & 2 & -2 & 2 \\ 0 & -3 & 3 & -6 \\ 0 & 0 & 1 & -1 \end{bmatrix}$$

$$r_2' = r_2 - 2r_1 \quad r_3' = r_3 - 3r_1 \quad r_3' = r_3 - \frac{4}{3}r_2$$

$$a = : \quad a1 = : \quad a2 = : \quad a3 = :$$

$$b = : \quad b1 = : \quad b2 = : \quad b3 = :$$

$$c = : \quad c1 = : \quad c2 = : \quad c3 = :$$

$$d = : \quad d1 = : \quad d2 = : \quad d3 = :$$

$$e = : \quad e1 = : \quad e2 = : \quad e3 = :$$

$$f = : \quad f1 = : \quad f2 = : \quad f3 = :$$

1. Consider the following linear system of equations.

$$x+2y-z=-1$$

$$3y+z=2$$

$$2x+y-z=0$$



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Question 3

Not yet answered

Marked out of 63.00

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Consider the following linear system of equations.

$$x + 2y - z = -1$$

$$3y + z = 2$$

$$2x + y - z = 0$$

1. Write down the augmented matrix for the above system of linear equations and reduce that to echelon form.

$$\begin{bmatrix} a & b & c & p \\ d & e & f & q \\ g & h & i & r \end{bmatrix} \rightarrow \begin{bmatrix} a1 & b1 & c1 & p1 \\ d1 & e1 & f1 & q1 \\ g1 & h1 & i1 & r1 \end{bmatrix} \rightarrow \begin{bmatrix} a2 & b2 & c2 & p2 \\ d2 & e2 & f2 & q2 \\ g2 & h2 & i2 & r2 \end{bmatrix}$$

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

$$r_3' = r_3 - 2r_1 \quad r_3' = r_3 + r_2$$

$$a = : \quad a1 = : \quad a2 = :$$

$$b = : \quad b1 = : \quad b2 = :$$

$$c = : \quad c1 = : \quad c2 = :$$

$$d = : \quad d1 = : \quad d2 = :$$

$$e = : \quad e1 = : \quad e2 = :$$

$$f = : \quad f1 = : \quad f2 = :$$

$$g = : \quad g1 = : \quad g2 = :$$

$$h = : \quad h1 = : \quad h2 = :$$

$$i = : \quad i1 = : \quad i2 = :$$

$$p = : \quad p1 = : \quad p2 = :$$

$$q = : \quad q1 = : \quad q2 = :$$

$$r = : \quad r1 = : \quad r2 = :$$

$$2z = 4$$

$$z = 2$$

$$3y + z = 2$$

$$y = 0$$

$$x + 2y - z = -1$$

$$x = 1$$

2. To find the solution, of the above linear system, obtain the three equations from the echelon form. From row 3,

1. Consider the following linear system of equations.

$$x - 2y + 3z = -2$$

$$-2x + y - 2z = 2$$

$$3x - 3y + 7z = -2$$

Consider the following linear system of equations.

$$\begin{aligned} x - 2y + 3z &= -2 \\ -2x + y - 2z &= 2 \\ 3x - 3y + 7z &= -2 \end{aligned}$$

(If your answer is not an integer, then write it as a quotient (eg: 2/5))  
(Simplify your answer as much as possible. eg: Do not keep 2/6, write 1/3 (No common factors should be there in numerator and denominator))

a) Write down the above three equations in matrix form  $Ax = b$ .

$|A| = -6$        $A \text{ invers} = cT / |A|$

$A = \begin{bmatrix} 1 & -2 & 3 \\ -2 & 1 & -2 \\ 3 & -3 & 7 \end{bmatrix}$        $C = \begin{bmatrix} 1 & 8 & 3 \\ 5 & -2 & 3 \\ 1 & -4 & -3 \end{bmatrix}$        $cT = \begin{bmatrix} 1 & 5 & 1 \\ 8 & -2 & -4 \\ 3 & 3 & -3 \end{bmatrix}$

$b = \begin{bmatrix} -2 \\ 2 \\ -2 \end{bmatrix}$        $\text{invers } A = \begin{bmatrix} 1/-6 & 5/-6 & 1/-6 \\ 8/-6 & -2/-6 & -4/-6 \\ 3/-6 & 3/-6 & -3/-6 \end{bmatrix}$

b) Consider the following. Find the values of the resulting matrix, when the following elementary row operations are applied in the given order.