11.2: (THE ALGEBRA OF MATRICES)

If $C = \begin{bmatrix} -1 & 3 \\ 2 & 1 \\ -3 & -2 \end{bmatrix}$ and $D = \begin{bmatrix} 0 & -1 & 2 \\ 1 & 2 & -4 \end{bmatrix}$, then the sum of all elements of

$CD - I$, is

A) -4

B) -14

C) -7

D) 13

E) 17

$A = \begin{bmatrix} 1 & -2 & 0 \\ 3 & 0 & -1 \\ 1 & 1 & 4 \end{bmatrix}$. The element in the third row and second column of the

matrix $A^2 + 3A$ is

A) 5

B) -2

C) 0

D) -1

E) 7

Let A be a (3×4) matrix and B be a (4×3) matrix. Then which one of the following expressions is possible to find?

A) $A(BA)$

B) $A + B$

C) B^{-1}

D) A^{-1}

E) $A(AB)$

If $A = \begin{bmatrix} 0 & -2 & 7 \\ 5 & 4 & 3 \end{bmatrix}, B = \begin{bmatrix} 3 & 1 \\ -1 & 5 \\ 6 & 0 \end{bmatrix}, C = \begin{bmatrix} 40 & -10 \\ 28 & 23 \end{bmatrix}$, and $D = AB - C$, then the element in the second row and second column of the matrix D is equal to

(a) 2

(b) 48

(c) 0

(d) 28

(e) -10

If A, B, and C are matrices each of order $n \times n$, then which one of the following is TRUE?

(a) $(AB)C = A(BC)$

(b) $(A + B)^2 = A^2 + 2AB + B^2$

(c) $(A + B) \cdot C = A + (B \cdot C)$

(d) $C(AB) + C(BA) = 2C(AB)$

(e) $(A - B)(A + B) = A^2 - B^2$

If X is a 3×3 matrix, I is the 3×3 identity matrix, and $A = \begin{bmatrix} 1 & 4 & 7 \\ 2 & 5 & 8 \\ 3 & 6 & 9 \end{bmatrix}$ such that $2(X - A) = X - 3I$, then the sum of all elements in the second row of matrix X is

A) 27

B) 18

C) 24

D) 31

E) 30

If $A = \begin{bmatrix} 2 & -1 & 3 \\ 4 & 0 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & -1 \\ 0 & 3 \\ 2 & 1 \end{bmatrix}$, then the sum of all the elements of the

matrix $AB =$

A) 9

B) 14

C) -5

D) 5

E) 3

If $A = \begin{bmatrix} 1 & 2 & -5 \\ 2 & 4 & 3 \\ 3 & -1 & -2 \end{bmatrix}$, then the element in the second row and third column

of A^2 is equal to:

A) -4

B) 4

C) -5

D) 11

E) 19

If $A = \begin{bmatrix} -5 & 4 & 1 \\ -5 & 7 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} -8 & 6 & -4 \\ -1 & 5 & -3 \\ -7 & 5 & -1 \end{bmatrix}$, then the sum of all the elements

of the third column of the matrix AB is

A) 4

B) 10

C) -6

D) 0

E) -3

If $A = \begin{pmatrix} 2 & 0 & -2 \\ 3 & -1 & 0 \end{pmatrix}$ and $B = \begin{pmatrix} 5 & 2 & -1 \\ 0 & -3 & 1 \\ -2 & 6 & 0 \end{pmatrix}$ then the element in the

second row and third column of the matrix AB is

A) 0

B) 2

C) -4

D) -2

E) 10

If $\begin{bmatrix} x+2 & 8 & -3 \\ 1 & 2y & 2x+1 \\ 7 & -2 & y+2 \end{bmatrix} = \begin{bmatrix} 2x+6 & 8 & -3 \\ 1 & 18 & -7 \\ 7 & -2 & 11 \end{bmatrix}$, then $x + y =$

A) -13

B) -5

C) 5

D) 4

E) 13

If $A = \begin{bmatrix} 2 & -1 & -2 & 5 \\ 3 & 0 & 1 & 4 \end{bmatrix}$, $B = \begin{bmatrix} -6 & 3 & 1 & 0 \\ 3 & 2 & 7 & 4 \end{bmatrix}$ and $3A + 5X = 3X + B$, then

$X =$

a) $\begin{bmatrix} -6 & 3 & \frac{7}{2} & \frac{15}{2} \\ -3 & 1 & 2 & -4 \end{bmatrix}$

b) $\begin{bmatrix} -4 & 2 & -1 & 3 \\ 6 & 2 & 8 & 8 \end{bmatrix}$

c) $\begin{bmatrix} 0 & 0 & -5 & 13 \\ 12 & 2 & 10 & 16 \end{bmatrix}$

d) $\begin{bmatrix} 0 & 0 & -\frac{5}{2} & \frac{15}{2} \\ 6 & 1 & 5 & 8 \end{bmatrix}$

e) $\begin{bmatrix} -12 & 6 & 7 & -15 \\ -6 & 2 & 4 & -8 \end{bmatrix}$

If $C = BA$ where $A = \begin{bmatrix} 0 & 1 & 2 & 3 \\ 4 & 5 & 6 & 7 \\ 8 & 9 & 10 & 11 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 0 & -2 \\ -3 & 4 & -5 \\ -6 & 7 & -8 \\ -9 & 10 & -11 \end{bmatrix}$ then c_{23},

the element in the second row and third column of C is equal to

A) 32

B) -32

C) 158

D) -158

E) 116

Given that $A = \begin{pmatrix} 1 & 0 \\ 2 & 1 \end{pmatrix}, B = \begin{pmatrix} 2 & 0 \\ x & 1 \end{pmatrix}, C = \begin{pmatrix} 0 & 0 \\ 6 & 1 \end{pmatrix}$. If $AB = 2A^2 - C$, then

$x =$

A) -4

B) 4

C) 0

D) 2

E) -2