

Multiple-Choice Test

Chapter 04.02

Vectors

1. A set of equations

$$4x_1 + 7x_2 + 11x_3 = 13$$

$$17x_1 + 39x_2 + 23x_3 = 31$$

$$13x_1 + 67x_2 + 59x_3 = 37$$

can also be written as

$$(A) \quad x_1 \begin{bmatrix} 4 \\ 17 \\ 13 \end{bmatrix} + x_2 \begin{bmatrix} 7 \\ 39 \\ 23 \end{bmatrix} + x_3 \begin{bmatrix} 11 \\ 23 \\ 59 \end{bmatrix} = \begin{bmatrix} 13 \\ 31 \\ 37 \end{bmatrix}$$

$$(B) \quad 4 \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} + 39 \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} + 59 \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 13 \\ 31 \\ 37 \end{bmatrix}$$

$$(C) \quad x_1 \begin{bmatrix} 4 \\ 7 \\ 11 \end{bmatrix} + x_2 \begin{bmatrix} 17 \\ 39 \\ 23 \end{bmatrix} + x_3 \begin{bmatrix} 13 \\ 67 \\ 59 \end{bmatrix} = \begin{bmatrix} 13 \\ 31 \\ 37 \end{bmatrix}$$

$$(D) \quad x_1 \begin{bmatrix} 13 \\ 17 \\ 4 \end{bmatrix} + x_2 \begin{bmatrix} 67 \\ 39 \\ 7 \end{bmatrix} + x_3 \begin{bmatrix} 59 \\ 23 \\ 11 \end{bmatrix} = \begin{bmatrix} 57 \\ 13 \\ 31 \end{bmatrix}$$

2. The magnitude of the vector, $V = (5, -3, 2)$ is

- (A) 4
(B) 10
(C) $\sqrt{38}$
(D) $\sqrt{20}$

3. The rank of the vector

$$\vec{A} \begin{bmatrix} 2 \\ 3 \\ 7 \end{bmatrix}, \begin{bmatrix} 6 \\ 9 \\ 21 \end{bmatrix}, \begin{bmatrix} 3 \\ 2 \\ 7 \end{bmatrix}$$

is

- (A) 1
- (B) 2
- (C) 3
- (D) 4

4. If $\vec{A} = (5, 2, 3)$ and $\vec{B} = (6, -7, 3)$, then $4\vec{A} + 5\vec{B}$ is

- (A) (50, -5, 6)
- (B) (50, -27, 27)
- (C) (11, -5, 6)
- (D) (20, 8, 12)

5. The dot product of two vectors \vec{A} and \vec{B}

$$\vec{A} = 3i + 5j + 7k$$

$$\vec{B} = 11i + 13j + 17k$$

most nearly is

- (A) 14.80
- (B) 33.00
- (C) 56.00
- (D) 217.0

6. The angle in degrees between two vectors \vec{u} and \vec{v}

$$\vec{u} = 3i + 5j + 7k$$

$$\vec{v} = 11i + 13j + 17k$$

most nearly is

- (A) 8.124
- (B) 11.47
- (C) 78.52
- (D) 81.88