1. a). $u \cdot v = (-2 \times 1) + (3 \times 0) = -2$ ✓

b) $u \cdot v = (\frac{1}{10} \times \frac{70}{3}) + [(-11) \times (-\frac{1}{3})] + (\frac{2}{3} \times \frac{1}{2}) = 1$ ✓

c) $u \cdot v = 1 \times 1 + 0 \times 1 + 1 \times 0 + 1 \times 0 + 1 \times 0 = 1$. ✓ 3

2. a). Namely $u \cdot v = 0$.

For v (x. y).

$u \cdot v = (1 \times x) + (1 \times y) = x + y$.

$\therefore$ Example $v = (2, -2)$. ✓

b). ~~$u \cdot v = a + 3b +$~~

$u \cdot v = 1 \times 1 + 3 \times y + 2 \times z = 0 \cdot x + 3y + 2z = 0$.

Example $v = (-2, 1, -1)$ ✓ 3

c). $u \cdot v = a + (-1) \times b + (-1) \times c + 2d = 0$.

$a - b - c + 2d = 0$. 2

Example $v = (0, 1, 1, 1)$. ✓

3. $A^T = \begin{bmatrix} 3 & -1 & 0 \\ 2 & -1 & 1 \end{bmatrix}$. $v = \begin{bmatrix} 1 \\ 1 \\ -1 \end{bmatrix}$

$A^T v = 3 \times 1 + 2 \times 1 ; (-1) \times 1 + (-1) \times 1 ; 0 \times (-1) + 1 \times (-1)$.

$= (5, -2, -1)$. —

4. $AB = \begin{bmatrix} 4 & 4 & 5 \\ 6 & 7 & 6 \\ 6 & 4 & 2 \end{bmatrix}$ — $BA = \begin{bmatrix} 4 & 3 & 6 \\ 4 & 7 & 6 \\ 5 & 5 & 2 \end{bmatrix}$ ✓ 1

Answer is No.