

$$1. (8E)_{16}$$

Base-10 :

$$E = 14$$

$$14 \times 16^0 = 14$$

$$8 \times 16^1 = 128$$

$$128 + 14 = \boxed{142}$$

Base-2 :

$$142 / 2 = 71 \quad | \quad 0$$

$$71 / 2 = 35.5 \quad | \quad 1$$

$$35 / 2 = 17.5 \quad | \quad 1$$

$$17 / 2 = 8.5 \quad | \quad 1$$

$$8 / 2 = 4 \quad | \quad 0$$

$$4 / 2 = 2 \quad | \quad 0$$

$$2 / 2 = 1 \quad | \quad 0$$

$$1 / 2 = 0.5 \quad | \quad 1$$

$$\boxed{= 01110001}$$

2.

$$2a. C = 1 \times 3$$

$$D = 3 \times 2$$

$$(1 \times 3) \cdot (3 \times 2) = \boxed{(1 \times 2)}$$

a.

$$2b. [3 \ 5 \ 7] \cdot \begin{bmatrix} 2 & -3 \\ 3 & 0 \\ -2 & 5 \end{bmatrix}$$

$$\star 3 \times 2 + 5 \times 3 + 7 \times -2 = 6 + 15 - 14 = 7$$

$$3 \times -3 + 5 \times 0 + 7 \times 5 = -9 + 0 + 35 = 26$$

$$= \boxed{\begin{bmatrix} 7 & 26 \end{bmatrix}}$$

b.

$$3. \ 23 - 3 = 20$$

$$\underline{20 / 5} = 4$$

$$\boxed{\underline{3 \ 7 \ 11 \ 15 \ 19 \ 23}}$$

3.