

$$122+z=64$$

$$z=64-122=-58$$

$$3y+6w=9 \quad \dots(3)$$

$$y+w=37 \quad \dots(4)$$

$$(3) - 3(4) \Rightarrow 3y + 6w = 9$$

$$\begin{array}{r} 3y + 3w = 111 \\ (-) \quad (-) \quad (-) \\ \hline \end{array}$$

$$3w = -102$$

$$w = -34$$

Sub. $w = -34$ in (4)

$$y - 34 = 37$$

$$y = 37 + 34 = 71$$

\therefore Solutions: $x = 122$

$$y = 71$$

$$z = -58$$

$$w = -34$$

$$\therefore D = \begin{bmatrix} 122 & 71 \\ -58 & -34 \end{bmatrix}$$

19) Find two consecutive natural numbers whose product is 20.

Answer : Let a natural number be x .

The next number = $x + 1$

$$x(x + 1) = 20$$

$$x^2 + x - 20 = 0$$

$$(x + 5)(x - 4) = 0$$

$$x = -5, 4$$

$$\therefore x = 4$$

($\because x \neq -5$, x is a natural number)

The next number = $4 + 1 = 5$

Two consecutive numbers are 4, 5.

20) A two digit number is such that the product of its digits is 18, when 63 is subtracted from the number, the digits interchange their places. Find the number.

Answer : Let the tens digits be x . Then the units digits = $\frac{18}{x}$

$$\therefore \text{Number} = 10x + \frac{18}{x}$$

and number obtained by interchanging the digits = $10 \times \frac{18}{x} + x$

$$\therefore \left(10x + \frac{18}{x}\right) - \left(10 \times \frac{18}{x} + x\right) = 63$$

$$\Rightarrow 10x + \frac{18}{x} - \frac{180}{x} - x = 0$$

$$\Rightarrow 9x - \frac{162}{x} - 63 = 0$$

$$\Rightarrow 9x^2 - 63x - 162 = 0$$

$$\Rightarrow x^2 - 7x - 18 = 0$$

$$\Rightarrow (x-9)(x+2) = 0 \Rightarrow x = 9, -2$$

But a digit can never be (-ve), so $x = 9$.

So, the required number = $10 \times 9 + \frac{18}{9} = 92$