Exercise 3E

Question 15:
Let the ten's digit and unit's digit of required number be x and y respectively.
We know,
Dividend = (divisor × quotient) + remainder
According to the given questiion:
$10x + y = 6 \times (x + y) + 0$
$10x - 6x + y - 6y = 0$
$4x - 5y = 0$ ---(1)
Number obtained by reversing the digits is $10y + x$
$10x + y - 9 = 10y + x$
$9x - 9y = 9$
$9(x - y) = 9$
$(x - y) = 1$ ---(2)
Multiplying (1) by 1 and (2) by 5, we get
$4x - 5y = 0$ ---(3)
$5x - 5y = 5$ ---(4)
Subtracting (3) from (4), we get
$x = 5$
Putting x = 5 in (1), we get

$$4 \times 5 - 5y = 0$$
$$\Rightarrow -5y = -20$$
$$\Rightarrow y = \frac{-20}{-5} = 4$$

x = 5 and y = 4
Hence, required number is 54.

Question 16:
Let the ten's and unit's digits of the required number be x and y respectively.
Then, $xy = 35$
Required number = $10x + y$
Also,
$(10x + y) + 18 = 10y + x$
$9x - 9y = -18$
$9(y - x) = 18$ ---(1)
$y - x = 2$
Now,

$$(y+x)^2 - (y-x)^2 = 4xy$$

$$\Rightarrow y+x = \sqrt{(y-x)^2 + 4xy}$$

$$= \sqrt{4+4\times 35}$$

$$= \sqrt{144}$$

$$= 12$$

$$y + x = 12 \quad ---(2)$$

Adding (1) and (2),
2y = 12 + 2 = 14
y = 7
Putting y = 7 in (1),
7 - x = 2
x = 5
Hence, the required number = 5 × 10 + 7
= 57

Question 17:
Let the ten's and units digit of the required number be x and y respectively.
Then, xy = 14
Required number = 10x + y
Number obtained on reversing the digits = 10y + x
Also,
(10x + y) + 45 = 10y + x
9(y - x) = 45
y - x = 5 ---(1)
Now,
$$(y+x)^2 - (y-x)^2 = 4xy$$

$$\Rightarrow (y+x) = \sqrt{(y-x)^2 + 4xy}$$

$$= \sqrt{25+4\times 14}$$

$$= \sqrt{81}$$

y + x = 9 ---(2) (digits cannot be negative, hence -9 is not possible)
On adding (1) and (2), we get
2y = 14
y = 7
Putting y = 7 in (2), we get
7 + x = 9
x = (9 - 7) = 2
x = 2 and y = 7
Hence, the required number is = 2 × 10 + 7
= 27

********** END *********