



Exercise 2E

$$\begin{array}{r}
 2 \overline{) 36, 48, 54} \\
 2 \overline{) 18, 24, 27} \\
 3 \overline{) 9, 12, 27} \\
 3 \overline{) 3, 4, 9} \\
 3 \overline{) 1, 4, 3} \\
 2 \overline{) 1, 4, 1} \\
 2 \overline{) 1, 2, 1} \\
 1, 1, 1
 \end{array}$$

$$\begin{aligned}
 \text{The required distance} &= 2 \times 2 \times 3 \times 3 \times 3 \times 2 \times 2 \\
 &= 16 \times 27 \\
 &= 432 \text{ cm}
 \end{aligned}$$

\therefore They will step together again at a distance of 432 cm from the starting point.

Q27

Answer :

The time when the lights will change simultaneously again will be quantity which is exactly divisible by 48, 72 and 108. The least time when they change simultaneously will be given by their LCM.

$$\begin{array}{r}
 2 \overline{) 48, 72, 108} \\
 2 \overline{) 24, 36, 54} \\
 2 \overline{) 12, 18, 27} \\
 2 \overline{) 6, 9, 27} \\
 3 \overline{) 3, 9, 27} \\
 3 \overline{) 1, 3, 9} \\
 3 \overline{) 1, 1, 3} \\
 1, 1, 1
 \end{array}$$

$$\begin{aligned}
 \text{Required time} &= 2^4 \times 3^3 \\
 &= 432 \text{ seconds} \\
 &= 7 \text{ min } 12 \text{ seconds}
 \end{aligned}$$

So, the lights will change simultaneously at 8:07:12 a.m.

Q28

Answer :

The length of the required rope must be such that it is exactly divisible by 45, 50 and 75. The least length will be given by the LCM of 45, 50 and 75.

$$\begin{array}{r}
 2 \overline{) 45, 50, 75} \\
 3 \overline{) 45, 25, 75} \\
 3 \overline{) 15, 25, 25} \\
 5 \overline{) 5, 25, 25} \\
 5 \overline{) 1, 5, 5} \\
 1, 1, 1
 \end{array}$$

$$\begin{aligned}
 \text{Required length} &= 3 \times 3 \times 5 \times 5 \times 2 \\
 &= 450 \text{ cm}
 \end{aligned}$$

So, the minimum length of the rope that can be measured by the full length of each of the three rods is 450 cm.

Q29

Answer :

The LCM of the time intervals of the beeps will give the time when the electronic devices will beep together.

LCM of 15 and 20:

$$\begin{array}{r}
 5 \overline{) 15, 20} \\
 3 \overline{) 3, 4} \\
 2 \overline{) 1, 4} \\
 2 \overline{) 1, 2} \\
 1, 1
 \end{array}$$

$$\begin{aligned}
 \text{Required time} &= 5 \times 3 \times 2 \times 2 \\
 &= 60 \text{ min}
 \end{aligned}$$

So, they will beep simultaneously after 60 min or 1 h.

\therefore They will beep together again at 7:00 a.m.

Q30

Answer :

***** END *****