

Exercise 8B

$$\Rightarrow 4.5x = 36$$
$$\Rightarrow x = 8$$

Hence, the third proportional is 8.

Q10

Answer:

The third proportional to 7 and x is 28.

Then,
$$7: x:: x: 28$$

 $\Rightarrow 7 \times 28 = x^2$ (Product of extremes = Product of means)
 $\Rightarrow x = 14$

Q11

Answer:

(i) Suppose that x is the mean proportional.

Then, 6: x:: x: 24

$$\Rightarrow$$
 $6\times24=x\times x$ (Product of extremes = Product of means) \Rightarrow x = 12

Hence, the mean proportional to 6 and 24 is 12.

(ii) Suppose that x is the mean proportional.

Then,
$$3:x::x:27$$
 $\Rightarrow 3\times 27 = x\times x$ (Product of extremes =Product of means) $\Rightarrow x^2 = 81$ $\Rightarrow x = 9$

Hence, the mean proportional to 3 and 27 is 9.

(iii) Suppose that x is the mean proportional.

Then, 0.4: x:: x: 0.9

$$\Rightarrow$$
 0.4 \times 0.9 = $x \times x$ (Product of extremes =Product of means) \Rightarrow $x^2 = 0.36$ \Rightarrow x = 0.6

Hence, the mean proportional to 0.4 and 0.9 is 0.6.

Q12

Answer:

Suppose that the number is x.

Then, (5 + x): (9 + x):: (7 + x): (12 + x)

⇒
$$(5 + x) \times (12 + x) = (9 + x) \times (7 + x)$$

(Product of extremes = Product of means)
⇒ $60 + 5x + 12x + x^2 = 63 + 9x + 7x + x^2$
⇒ $60 + 17x = 63 + 16x$
⇒ $x = 3$

Hence, 3 must be added to each of the numbers: 5, 9, 7 and 12, to get the numbers which are in proportion.

Q13

Answer:

Suppose that x is the number that is to be subtracted.

Then,
$$(10 - x)$$
: $(12 - x)$:: $(19 - x)$: $(24 - x)$

$$\Rightarrow$$
 $(10-x) \times (24-x) = (12-x) \times (19-x)$

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$$\begin{array}{l} \Rightarrow 240 - 10x - 24x + x^2 = 228 - 12x - 19x + x^2 \\ \Rightarrow 240 - 34x = 228 - 31x \\ \Rightarrow 3x = 12 \end{array}$$

Hence, 4 must be subtracted from each of the numbers: 10, 12, 19 and 24, to get the numbers which are in proportion.

Q14

Answer:

Distance represented by 1 cm on the map = 5000000 cm = 50 km

Distance represented by 3 cm on the map = 50×4 km = 200 km

:. The actual distance is 200 km.

Q15

Answer

(Height of tree): (height of its shadow) = (height of the pole): (height of its shadow)

Suppose that the height of pole is x cm.

Then, 6:8 = x:20

$$\Rightarrow x = \frac{6 \times 20}{8} = 15$$

: Height of the pole = 15 cm