# Sampurna Jan 2026

## Quantitative Aptitude

DPP: 2

## Ratio and Proportion, Indices and Logarithm

**Q1** $4,\ *\ ,\ 9,\ 13\frac{1}{2}$ are in proportion. Then * is
(A) 6 (B) 8
(C) 9 (D) None of these

**Q2** The numbers $14, 16, 35, 42$ are not in proportion. The fourth term for which they will be in proportion is
(A) 45 (B) 40
(C) 32 (D) none of these

**Q3** The number which has the same ratio to 26 that 6 has to 13 is
(A) 11 (B) 10
(C) 21 (D) None of these

**Q4** The mean proportional between 1.4 gm and 5.6 gm is
(A) 28 gm (B) 2.8 gm
(C) 3.2 gm (D) none of these

**Q5** If $x : y = z : w = 2.5 : 1.5$, the value of $\frac{(x+z)}{(y+w)}$ is
(A) $1$ (B) $\frac{3}{5}$
(C) $\frac{5}{3}$ (D) none of these

**Q6** If $\frac{u}{v} = \frac{w}{p}$ implies $\frac{(u-v)}{(u+v)} = \frac{(w-p)}{(w+p)}$. The process is called
(A) Invertendo (B) Alternendo
(C) Addendo (D) none of these

**Q7** If $A : B = 3 : 2$ and $B : C = 3 : 5$, then $A : B : C$ is
(A) $9 : 6 : 10$
(B) $6 : 9 : 10$
(C) $10 : 9 : 6$
(D) none of these

**Q8** The number which when subtracted from each of the terms of the ratio 19 : 31 reducing it to 1 : 4 is
(A) 15 (B) 5
(C) 1 (D) None of these

**Q9** Find the ratio of third proportional of 12, 30 and mean proportional of 9, 25.
(A) 7 : 2 (B) 5 : 1
(C) 9 : 4 (D) None of these

**Q10** Two numbers are in the ratio 2 : 3. If 4 be subtracted from each, they are in the ratio 3 : 5. The numbers are
(A) (16, 24) (B) (4, 6)
(C) (2, 3) (D) none of these

**Q11** If $a : b = 8 : 4$, then find the value of $(a+b) : (a-b)$.
(A) 1 (B) 2
(C) 3 (D) 4

**Q12** The number of boys and girls in a class are in ratio 9 : 5. If 4 boys and 4 girls went for a district level competition the ratio becomes 2 : 1. Find the total number of boys and girls in the class.
(A) 36 and 20 (B) 45 and 25
(C) 27 and 15 (D) None of these

**Q13** 12, 16, *, 20 are in proportion. Then * is
(A) 25 (B) 14
(C) 15 (D) None of these

**Q14** If $\frac{x}{2} = \frac{y}{3} = \frac{z}{7}$, then the value of $\frac{(2x-5y+4z)}{2y}$ is
(A) $\frac{6}{23}$ (B) $\frac{23}{6}$
(C) $\frac{3}{2}$ (D) $\frac{17}{6}$

**Q15** A bag contained 25 paise, 10 paise and 5 paise are in the ratio 3 : 2 : 1. The total value of ₹40, the number of 5 paise coins is
(A) 45 (B) 48

(C) 40 (D) 20

# Answer Key

| | |
|---|---|
| Q1 | (A) |
| Q2 | (B) |
| Q3 | (D) |
| Q4 | (B) |
| Q5 | (C) |
| Q6 | (D) |
| Q7 | (A) |
| Q8 | (A) |
| Q9 | (B) |
| Q10 | (A) |
| Q11 | (C) |
| Q12 | (A) |
| Q13 | (C) |
| Q14 | (D) |
| Q15 | (C) |

# Hints & Solutions

**Q1 Text Solution:**

Given: $4,\ *\ ,\ 9,\ 13\frac{1}{2}$ are in proportion

Let * is represented by $x$.

Now, by cross product rule

Product of extremes = Product of means

$\Rightarrow x \times 9 = 4\ \times 13\frac{1}{2}$

$\Rightarrow x \times 9 = 4 \times \frac{27}{2}$

$\Rightarrow x = \frac{4\times 27}{9\times 2}$

$\Rightarrow x = 6$

Therefore, the value of * is 6.

Hence, the correct option is (A).

**Q2 Text Solution:**

We know that,

If $a\ :\ b = c\ :\ d$ then $ad = bc$

Clearly, $\frac{14}{16} \neq \frac{35}{42}$

Let us assume the fourth proportion to be $x$ for which $14,\ 16,\ 35,\ x$ will be in proportion.

i.e., $14\ :\ 16 = 35\ :\ x$

$\Rightarrow \frac{14}{16} = \frac{35}{x}$

$\Rightarrow x = \frac{16\times 35}{14}$

$\Rightarrow x = \ 8 \times 5$

$\Rightarrow x = 40$

Therefore, the fourth term of proportion should be 40.

Hence, the correct option is (B).

**Q3 Text Solution:**

Let the number is x which has same ratio to 26 that 6 has to 13.

We can say that x, 26, 6 and 13 are in proportion.

$\Rightarrow x\ :\ 26\ =\ 6\ :\ 13$

$\Rightarrow \frac{x}{26} = \frac{6}{13}$

$\Rightarrow x = 26 \times \frac{6}{13}$

$\therefore\ x = 12$

Hence, the correct option is (D) i.e., none of these.

**Q4 Text Solution:**

Let the mean proportional between 1.4 gm and 5.6 gm be 'b' gm.

We know that, if b is mean proportional between a and c, then $b^2 = ac$

According to the question,

$b^2\ =\ a\ \times\ c$

$\Rightarrow b\ =\ \sqrt{a\ \times\ c}$

$\Rightarrow b\ =\ \sqrt{1.4\ \times\ 5.6}$

$\Rightarrow b\ =\ \sqrt{1.4\ \times\ 1.4\ \times\ 2\ \times 2}$

$\Rightarrow b\ =\ 1.4\ \times\ 2\ =\ 2.8$

Therefore, the mean proportional between 1.4 gm and 5.6 gm is 2.8 gm.

Hence, the correct option is (B) i.e., 2.8 gm.

**Q5 Text Solution:**

Given, $x\ :\ y = z\ :\ w = 2.5\ :1.5$

i.e., $\frac{x}{y} = \frac{z}{w} = \frac{2.5}{1.5}$.... (1)

We know that,

If $a\ :\ b = c\ :\ d,$ then $a\ :\ b = c\ :\ d = (a + c)\ :\ (b + d)$ (by Addendo)

Applying this concept, we get

$\frac{x}{y} = \frac{z}{w} = \frac{x+z}{y+w}$

$\Rightarrow \frac{x+z}{y+w} = \frac{2.5}{1.5}$ (from eq. 1)

$\Rightarrow \frac{x+z}{y+w} = \frac{25\times 10}{15\times 10} = \frac{25}{15}$

$\Rightarrow \frac{x+z}{y+w} = \frac{5}{3}$

Therefore, the value of $\frac{x+z}{y+w}$ is $\frac{5}{3}$.

Hence, the correct option is (C).

**Q6 Text Solution:**

Given: $\frac{u}{v} = \frac{w}{p}$

Applying Componendo to the given equation, we get

$\frac{u+v}{v} = \frac{w+p}{p}$..... (1)

Now, applying Dividendo to the given equation, we get

$\frac{u-v}{v} = \frac{w-p}{p}$..... (2)

Dividing equation (2) by (1), we get

$\frac{(u-v)}{(u+v)} = \frac{(w-p)}{(w+p)}$

Therefore, the process is called Componendo and Dividendo.

Hence, the correct option is (D) i.e., none of these.

**Q7 Text Solution:**

Given, $A : B = 3 : 2$ and $B : C = 3 : 5$

i.e., $\frac{A}{B} = \frac{3}{2}$ and $\frac{B}{C} = \frac{3}{5}$

$\Rightarrow \frac{A}{B} = \frac{3\times3}{2\times3}$ and $\frac{B}{C} = \frac{3\times2}{5\times2}$

$\Rightarrow \frac{A}{B} = \frac{9}{6}$ and $\frac{B}{C} = \frac{6}{10}$

$\Rightarrow A : B = 9 : 6$ and $B : C = 6 : 10$

$\Rightarrow A : B : C = 9 : 6 : 10$

Hence, the correct option is (A).

**Q8 Text Solution:**

Let the unknown number be x.

Now, as per the question

$\frac{19-x}{31-x} = \frac{1}{4}$

On cross-multiplying, we get

$4(19-x) = 1(31-x)$

$76 - 4x = 31 - x$

$3x = 45$

$\therefore x = 15$

Hence, the correct option is (A) i.e., 15.

**Q9 Text Solution:**

Let the third proportional of 12, 30 be x, then 12,30 and x are in continued proportion

i.e., 12 : 30 :: 30 : x

$\Rightarrow \frac{12}{30} = \frac{30}{x}$

$\Rightarrow x = \frac{30\times30}{12}$

$\Longrightarrow x = 75$

Now, the mean proportional of 9, 25 = $\sqrt{9\times25} = 3\times5 = 15$

Thus, the required ratio is 75 : 15

$= \frac{75}{15} = \frac{5}{1}$

$= 5 : 1$

Hence, the correct option is (B) i.e., 5 : 1.

**Q10 Text Solution:**

Given: Ratio of the two numbers = 2 : 3

Let the two numbers be 2x and 3x.

According to the question,

$\frac{2x-4}{3x-4} = \frac{3}{5}$

$\Rightarrow 5(2x-4) = 3(3x-4)$

$\Rightarrow 10x - 20 = 9x - 12$

$\Rightarrow 10x - 9x = 20 - 12$

$\Rightarrow x = 8$

Thus, the numbers are

$2x = 2(8) = 16$

and $3x = 3(8) = 24$

Hence, the correct option is (A) i.e., (16, 24).

**Q11 Text Solution:**

Given; $a : b = 8 : 4$

Using Componendo and Dividendo

$(a+b) : (a-b) = \frac{8+4}{8-4}$

$= \frac{12}{4} = 3$

Hence, the correct option is (C) i.e., 3.

**Q12 Text Solution:**

Let the original ratio between boys and girls be 9x and 5x

If 4 boys and 4 girls went ratio becomes 2 : 1

$\frac{9x-4}{5x-4} = \frac{2}{1}$

$\Rightarrow 9x - 4 = 2(5x - 4)$

$\Rightarrow 9x - 4 = 10x - 8$

$\Rightarrow 10x - 9x = -4 + 8$

$\Rightarrow x = 4$

Therefore, number of boys = $9 \times 4$ = 36

And the number of girls = $5 \times 4$ = 20

**Q13 Text Solution:**

Given, $12, 16, *, 20$ are in proportion

Let * is represented by x

$\Rightarrow 12, 16, x, 20$ are in proportion

Now, by cross product rule

Product of extremes = Product of means

i.e., $12 \times 20 = 16 \times x$

$\Rightarrow x = \frac{12\times20}{16}$

$\Rightarrow x = 3 \times 5$

$\Rightarrow x = 15$

Therefore, the value of * is 15.

Hence, the correct answer is option (C).

**Q14 Text Solution:**

Given: $\frac{x}{2} = \frac{y}{3} = \frac{z}{7}$

Consider $\frac{x}{2} = \frac{y}{3} = \frac{z}{7} = k$

$\Rightarrow x = 2k,\ y = 3k,\ z = 7k$

Now, substituting the values of $x$, $y$ and $z$ in the given expression, we get

$\frac{(2x-5y+4z)}{2y}$

$= \frac{2(2k) - 5(3k) + 4(7k)}{2(3k)}$

$= \frac{4k - 15k + 28k}{6k}$

$= \frac{17k}{6k}$

$= \frac{17}{6}$

Therefore, the required value is $\frac{17}{6}$.

Hence, the correct option is (D).

**Q15 Text Solution:**

Given, Ratio of 25 paise, 10 paise and 5 paise coins = 3 : 2 : 1

Total value = ₹$40$

Let the number of 25 paise coins, 10 paise coins and 5 paise coins be 3x, 2x and x respectively.

Then, the value = $0.25 \times 3x + 0.10 \times 2x + 0.05 \times x$

$\Rightarrow 0.75x + 0.20x + 0.05x = 40$

$\Rightarrow x = 40$

Therefore, the number of 5 paise coins = x = 40.