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## MATHS

## BOOKS - SELINA MATHS (ENGLISH)

## RATIO AND PROPORTION

Exercise 7 A

1. If $a: b=5: 3$, find $: \frac{5 a-3 b}{5 a+3 b}$.

D Watch Video Solution
2. If $x: y=4: 7$, find the value of $(3 x+2 y):(5 x+y)$.
3. If $a: b=3: 8$, find the value of $\frac{4 a+3 b}{6 a-b}$.

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4. If $(a-b):(a+b)=1: 11$ find the ratio
$(5 a+4 b+15):(5 a-4 b+3)$.

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5. Find the number which bears the same ratio to $\frac{7}{33}$ that $\frac{8}{21}$ does to $\frac{4}{9}$.

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6. If $\frac{m+n}{m+3 n}=\frac{2}{3}$, find : $\frac{2 n^{2}}{3 m^{2}+m n}$.

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7. Find $\frac{x}{y}$, when $x^{2}+6 y^{2}=5 x y$.

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8. If the ratio between 8 and 11 is the same as the ratio of $2 x-y$ to $x+2 y$, find the value of $\frac{7 x}{9 y}$.

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9. Divide Rs. 1,290 into $A, B$ and $C$ such that $A$ is $\frac{2}{5}$ of $B$ and $B: C=4: 3$.
10. A school has 630 students. The ratio of the number of boys to the number of girls is $3: 2$. This ratio changes to $7: 5$ after the admission of 90 new students. Find the number of newly admitted boys.

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11. What quantity must be subtracted from each term of the ratio $9: 17$ to make it equal to $1: 3$ ?

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12. The monthly pocket money of Ravi and Sanjeev are in the ratio 5:7. Their expenditures are in the ratio $3: 5$. If each saves $R s .80$ every month, find their monthly pocket money.

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13. The work done by $(x-2)$ men in $(4 x+1)$ days and the work done by $(4 x+1)$ men in $(2 x-3)$ days are in the ratio $3: 8$. Find the value of $x$.

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14. The bus fare between two cities is increased in the ratio $7: 9$.

Find the increase in the fare, if :
(i) the original fare is Rs.245,
(ii) the increased fare is Rs. 207 .

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15. By increasing the cost of entry ticket to a fair in the ratio $10: 13$, the number of visitors to the fair has decreased in the ratio 6:5. In what ratio has the total collection increased or decreased?

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16. In a basket, the ratio between the number of oranges and the number of apples is $7: 13$. If 8 oranges and 11 apples are eaten, the ratio between the number of oranges and the number of apples becomes $1: 2$, Find the original number of oranges and the original number of apples in the basket.
17. In a mixture of 126 kg of milk and water, milk and water are in the ratio $5: 2$. How much water must be added to the mixture to make this ratio $3: 2$ ?

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18. (a) If $A: B=3: 4$ and $B: C=6: 7$, find:
(i) $A: B: C$
(ii) $A: C$
(b) If $A: B=2: 5$ and $A: C=3: 4$, find : $A: B: C$.

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19. (i) If $3 A=4 B=6 C$, find : $A: B: C$.
(ii) If $2 a=3 b$ and $4 b=5 c$, find: $a: c$.
20. Find the compound ratio of:
(i) $2: 3,9: 14$ and $14: 27$.
(ii) $2 a: 3 b, m m: x^{2}$ and $x: n$.
(iii) $\sqrt{2}: 1,3: \sqrt{5}$ and $\sqrt{20}: 9$.

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21. Find duplicate ratio of:
(i) $3: 4$
(ii) $3 \sqrt{3}: 2 \sqrt{5}$

- Watch Video Solution

22. Find triplicate ratio of:
(i) $1: 3$
(ii) $\frac{m}{2}: \frac{n}{3}$

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23. Find sub-duplicate ratio of:
(i) $9: 16$
(ii) $(x-y)^{4}:(x+y)^{6}$

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24. Find sub-triplicate ratio of :
(i) $64: 27$
(ii) $x^{3}: 125 y^{3}$
25. Find the reciprocal ratio of :
(i) $5: 8$
(ii) $\frac{x}{3}: \frac{y}{7}$

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26. If $(x+3):(4 x+1)$ is the duplicate ratio of $3: 5$, find the value of $x$.

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27. If $m: n$ is the duplicate ratio of $(m+x):(n+x)$, show that:
$x^{2}=m n$
28. If $(3 x-9):(5 x+4)$ is the triplicate ratio of $3: 4$, find the value of $x$.

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29. Find the ratio compounded of the reciprocal ratio of $15: 28$, the sub-duplicate ratio of $36: 49$ and the trilicate ratio of $5: 4$.

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30. (a) If $r^{2}=p q$, show that $p: q$ is the duplicate ratio of $(p+r)$
$:(q+r)$.
(b) If $(p-x):(q-x)$ be the duplicate ratio of $p: q$ then show
that : $\frac{1}{p}+\frac{1}{q}=\frac{1}{r}$.

Exercise 7 B

1. Find the fourth proportional to :
(i) $1.5,4.5$ and 3.5
(ii) $3 a, 6 \mathrm{a}^{\wedge}(2)$ and $2 \mathrm{ab}^{\wedge}(2)^{\wedge}$

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2. Find the third proportional to :
(i) $2 \frac{2}{3}$ and 4
(ii) $a-b$ and $a^{2}-b^{2}$
3. Find the mean proportional between:
(i) $6+3 \sqrt{3}$ and $8-4 \sqrt{3}$
(ii) $a-b$ and $\mathrm{a}^{\wedge}(3)-\mathrm{a}^{\wedge}(2) \mathrm{b}$.

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4. If $x+5$ is the mean proportion between $x+2$ and $x+9$ : find the value of $x$.

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5. If $x^{\wedge}(2), 4$ and 9 are in continued proprotion, find $x$.
6. What number must be added to each of the numbers $6,15,20$ and 43 to make them proportional ?

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7. (i) If $a, b, c$ are in continued proportion, show that : $\frac{a^{2}+b^{2}}{b(a+c)}=\frac{b(a+c)}{b^{2}+c^{2}}$.
(ii) If $a, b, c$ are in continued proportion and $a(b-c)=2 b$, prove that:
$a-c=\frac{2(a+b)}{a}$.
(iii) If $\frac{a}{b}=\frac{c}{d}$ show that :
$\frac{a^{3} c+a c^{3}}{b^{3} d+b d^{3}}=\frac{(a+c)^{4}}{(b+d)^{4}}$.

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8. What least number must be subtracted from each of the numbers 7,17 and 47 so that the remainders are in continued proportion?

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9. If $y$ is the mean proportional between $x$ and $z$, show that $x y+y z$ is the mean proportional between $\mathrm{x}^{\wedge}(2)+\mathrm{y}^{\wedge}(2)$ and $y^{\wedge}(2)+z^{\wedge}(2)$.

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10. If $q$ is the mean proportional between $p$ and $r$, show that :
$p q r(p+q+r)^{3}=(p q+q r+p r)^{3}$.
11. If three quantities are in continued proportion, show that the ratio of the first to the third is the duplicate ratio of the first to the second.

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12. If $y$ is the mean proportional between $x$ and $z$, prove that :
$\frac{x^{2}-y^{2}+z^{2}}{x^{-2}-y^{-2}+z^{-2}}=y^{4}$.

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13. Given four quantities $a, b, c$ and $d$ are in proportion. Show that :

$$
(a-c) b^{2}:(b-d) c d=\left(a^{2}-b^{2}-a b\right):\left(c^{2}-d^{2}-c d\right)
$$

14. Find two numbers such that the mean proportional between them is 12 and the third proportional to them is 96 .

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15. Find the third proportional to $\frac{x}{y}+\frac{y}{x}$ and $\sqrt{x^{2}+y^{2}}$

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16. If $p: q=r: s$, then show that : $m p+n q: q=m r+n s: s$.

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17. If $\mathrm{p}+\mathrm{r}=\mathrm{mq}$ and $\frac{1}{q}+\frac{1}{s}=\frac{m}{r}$, then prove that : $\mathrm{p}: \mathrm{q}=\mathrm{r}: \mathrm{s}$.

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Exercise 7 C

1. If $a: b=c: d$, prove that:
(i) $5 a+7 b: 5 a-7 b=5 c+7 d: 5 c-7 d$.
(ii) $(9 a+13 b)(9 c-13 d)=(9 c+13 d)(9 a-13 b)$.
(iii) $x a+y b: x c+y d=b: d$

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2. If $a: b=c: d$, prove that:

$$
(6 a+7 b)(3 c-4 d)=(6 c+7 d)(3 a-4 b)
$$

- Watch Video Solution

3. Given, $\frac{a}{b}=\frac{c}{d}$, prove that :
$\frac{3 a-5 b}{3 a+5 b}=\frac{3 c-5 d}{3 c+5 d}$

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4. If $\frac{5 x+6 y}{5 u+6 v}=\frac{5 x-6 y}{5 u-6 v}$ : then prove that $x: y=u: v$.

## - Watch Video Solution

5. If $(7 a+8 b)(7 c-8 d)=(7 a-8 b)(7 c+8 d)$ :
prove that $a: b=c: d$.

## - Watch Video Solution

6. (i) If $x=\frac{6 a b}{a+b}$, find the value of:
$\frac{x+3 a}{x-3 a}+\frac{x+3 b}{x-3 b}$.
(ii) $a=\frac{4 \sqrt{6}}{\sqrt{2}+\sqrt{3}}$, find the value of:
$\frac{a+2 \sqrt{2}}{a-2 \sqrt{2}}+\frac{a+2 \sqrt{3}}{a-2 \sqrt{3}}$.

## (D) Watch Video Solution

## 7.

$(a+b+c+d)(a-b-c+d)=(a+b-c-d)(a-b+c-d)$
prove that: $a: b=c: d$.

## - Watch Video Solution

8. If $\frac{a-2 b-3 c+4 d}{a+2 b-3 c-4 d}=\frac{a-2 b+3 c-4 d}{a+2 b+3 c+4 d}$, showt $\widehat{:} 2 \mathrm{ad}=$ $3 b c^{\prime}$.
9. If $\left(a^{2}+b^{2}\right)\left(x^{2}+y^{2}\right)=(a x+b y)^{2}$, prove that $: \frac{a}{x}=\frac{b}{y}$.

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10. If $a, b$ and $c$ are in continued proportion, prove that:
(i) $\frac{a^{2}+a b+b^{2}}{b^{2}+b c+c^{2}}=\frac{a}{c}(i i) \frac{a^{2}+b^{2}+c^{2}}{(a+b+c)^{2}}=\frac{a-b+c}{a+b+c}$.

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11. Using properties of proportion, solve for $x$ :
(i) $\frac{\sqrt{x+5}+\sqrt{x-16}}{\sqrt{x+5}-\sqrt{x-16}}=\frac{7}{3}$
(ii) $\frac{\sqrt{x+1}+\sqrt{x-1}}{\sqrt{x+1}-\sqrt{x-1}}=\frac{4 x-1}{2}$.
(iii) $\frac{3 x+\sqrt{9 x^{2}-5}}{3 x-\sqrt{9 x^{2}-5}}=5$.
12. If $x=\frac{\sqrt{a+3 b}+\sqrt{a-3 b}}{\sqrt{a+3 b}-\sqrt{a-3 b}}$ prove that : $3 b x^{2}-2 a x+3 b=0$.

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13. Using the properties of proportion, solve for $x$, given $\frac{x^{4}+1}{2 x^{2}}=\frac{17}{8}$.

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14. If $x=\frac{\sqrt{m+n}+\sqrt{m-n}}{\sqrt{m+n}-\sqrt{m-n}}$, express $n$ in the terms of $x$ and $m$.

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15. If $\frac{x^{3}+3 x y^{2}}{3 x^{2} y+y^{3}}=\frac{m^{3}+3 m n^{2}}{3 m^{2} n+n^{3}}$, show that: $n x=m y$.

## D Watch Video Solution

## Exercise 7 D

1. If $a: b=3: 5$, find :
$(10 a+3 b):(5 a+2 b)$

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2. If $5 x+6 y: 8 x+5 y=8: 9$, find $: x: y$.

## - Watch Video Solution

3. If $(3 x-4 y):(2 x-3 y)=(5 x-6 y):(4 x-5 y)$, find : $x: y$.

## D Watch Video Solution

4. Find the :
(i) duplicate ratio of $2 \sqrt{2}: 3 \sqrt{5}$
(ii) triplicate ratio of $2 a: 3 b$,
(iii) sub-duplicate ratio of $9 x^{2} a^{4}: 25 y^{6} b^{2}$
(iv) sub-triplicate ratio of 216:343
(v) reciprocal ratio of $3: 5$
(vi) ratio compounded of the duplicate ratio of $5: 6$, the reciprocal ratio of $25: 42$ and the sub-duplicate ratio of $36: 49$.

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5. Find the value of $x$, if :
(i) $(2 x+3):(5 x-38)$ is the duplicate ratio of sqrt(5) : sqrt(6).
(ii) $(2 x+1):(3 x+13)$ is the sub-duplicate ratia of $9: 25$.
(iii) $(3 x-7):(4 x+3)$ is the sub-triplicate ratio of $8: 27$.

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6. What quantity must be added to each term of the ratio $x: y$ so that it may become equal to $c: d$ ?

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7. A woman reduces her weight in the ratio $7: 5$. What does her weight become if originally it was 84 kg ?
8. If $15\left(2 x^{2}-y^{2}\right)=7 x y$, find $x: y$, if $x$ and $y$ both are positive.

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9. Find the :
(i) fourth proportional to $2 x y, x^{2}$ and $y^{2}$.
(ii) third proportional to $a^{2}-b^{2}$ and $a+b$.
(iii) mean proportion to $(x-y)$ and $\left(x^{3}-x^{2} y\right)$

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10. Find two numbers such that the mean proportional between them is 14 and third proportional to them is 112 .
11. If $x$ and $y$ be unequal and $x: y$ is the duplicate ratio of $x+z$ and $y+z$, prove that $z$ is Mean proportional between $x$ and $y$.

## D Watch Video Solution

12. If $x=\frac{2 a b}{a+b}$, find the value of : $\frac{x+a}{x-a}+\frac{x+b}{x-b}$.

## D Watch Video Solution

13. If $(4 a+9 b)(4 c-9 d)=(4 a-9 b)(4 c+9 d)$, prove that : $a: b=c: d$.

## - Watch Video Solution

14. If $\frac{a}{b}=\frac{c}{d}, \quad$ show $\quad$ that
$(a+b):(c+d)=\sqrt{a^{2}+b^{2}}: \sqrt{c^{2}+d^{2}}$

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15. There are 36 members in a student council in a school and the ratio of the number of boys to the number of girls is $3: 1$. How many more girls should be added to the council so that the ratio of number of boys to the number of girls may be $9: 5$ ?

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16. If $7 x-15 y=4 x+y$, find the value of $x: y$. Hence, use componendo and dividendo to find the values of:
(i) $\frac{9 x+5 y}{9 x-5 y}$
(il) $\frac{3 x^{2}+2 y^{2}}{3 x^{2}-2 y^{2}}$

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17. If $(4 m+3 n) /(4 m-3 n)=(7) /(4)$ use properties of proportion to find :
(i) $m: n$
(ii) $\frac{2 m^{2}-11 n^{2}}{2 m^{2}+11 n^{2}}$.

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18. If $x, y, z$ are in continued proportion, prove that : $\frac{(x+y)^{2}}{(y+z)^{2}}=\frac{x}{z}$.
19. Given $x=\frac{\sqrt{a^{2}+b^{2}}+\sqrt{a^{2}-b^{2}}}{\sqrt{a^{2}+b^{2}}-\sqrt{a^{2}-b^{2}}}$.

Use componendo and dividendo to prove that:
$b^{2}=\frac{2 a^{2} x}{x^{2}+1}$.

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20. If $\frac{x^{2}+y^{2}}{x^{2}-y^{2}}=2 \frac{1}{8}$, find :
(i) $\frac{x}{y}$
(ii) $\frac{x^{3}+y^{3}}{x^{3}-y^{3}}$

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21. Using componendo and dividendo, find the value of $x$ if
$\frac{\sqrt{3 x+4}+\sqrt{3 x-5}}{\sqrt{3 x+4}-\sqrt{3 x-5}}=9$.
22. If $x=\frac{\sqrt{a+1}+\sqrt{a-1}}{\sqrt{a+1}-\sqrt{a-1}}$, using properties of proportion show that

$$
x^{2}-2 a x+1=0
$$

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23. Given $\frac{x^{3}+12 x}{6 x^{2}+8}=\frac{y^{3}+27 y}{9 y^{2}+27}$. Using componendo and devidendo find $x: y$.

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24. If $\frac{x}{a}=\frac{y}{b}=\frac{z}{c}$ show that $\frac{x^{3}}{a^{3}}+\frac{y^{3}}{b^{3}}+\frac{z^{3}}{c^{3}}=\frac{3 x y z}{a b c}$
25. If $b$ is the mean proportion between $a$ and $c$, show that :
$\frac{a^{4}+a^{2} b^{2}+b^{4}}{b^{4}+b^{2} c^{2}+c^{4}}=\frac{a^{2}}{c^{2}}$

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26. If $\frac{7 m+2 n}{7 m-2 n}=\frac{5}{3}$ use properties of proportion to find
(i) $m: n$
(ii) $\frac{m^{2}+n^{2}}{m^{2}-n^{2}}$

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27. (i) If $x$ and $y$ both are positive and $\left(2 x^{2}-5 y^{2}\right): x y=1: 3$, find $x: y$.
(ii) Find $x$, if $16\left(\frac{a-x}{a+x}\right)^{3}=\frac{a+x}{a-x}$.
28. If $(3 a+2 b):(5 a+3 b)=18: 29$. Find $a: b$.

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2. if $a: b=5: 3$, find $(5 a+8 b):(6 a-7 b)$.

## - Watch Video Solution

3. Two numbers are in the ratio $3: 5$. If 8 is added to each number, the ratio becomes $2: 3$. Find the numbers.

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4. (i) What quantity must be added to each term of the ratio $8: 15$ so that it becomes equal to $3: 5$ ?
(ii) What quantity must be subtracted from each term of the ratio $a: b$ so that it becomes $c: d$ ?

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5. The work done by $(x-3)$ men in $(2 x+1)$ days and the work done by $(2 x+1)$ men in $(x+4)$ days are in the ratio $3: 10$. Find the value of $x$.

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6. When the fare of a certain journey by an airliner was increased in the ratio 5:7 the cost of the ticket for the journey became Rs.
1.421. Find the increase in the fare.

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7. In a regiment, the ratio of number of officers to the number of soldiers was 3:31 before a battle. In the battle 6 officers and 22 soldiers were killed. The ratio between the number of officers and the number of soldiers now is $1: 13$. Find the number of officers and soldiers in the regiment before the battle.

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8. if $\frac{a}{b+c}=\frac{b}{c+a}=\frac{c}{a+b}$ and $a+b+c=0$ : show that each given ratio is equal to -1 .

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9. if $\frac{a}{b+c}=\frac{b}{c+a}=\frac{c}{a+b}$ and $a+b+c \neq 0$, show that each given ratio is equal to $\frac{1}{2}$.

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10. Find the compound ratio of :
(i) $3 a: 2 b, 2 m: n$ and $4 x: 3 y$
(ii) $a-b: a+b,(a+b)^{2}: a^{2}+b^{2}$ and $a^{4}-b^{4}:\left(a^{2}-b^{2}\right)^{2}$.

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11. Find the ratio compounded of the duplicate ratio of $5: 6$, the reciprocal ratio of $25: 42$ and the sub-triplicate ratio of $216: 343$.

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12. Find : (i) the fourth proportional to 3,6 and 4.5 .
(ii) the mean proportional between 6.25 and 0.16 .
(iii) the third proportional to 1.2 and 1.8.

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13. Quantities $a, 2,10$ and $b$ are in continued proportion, find the values of $a$ and $b$.

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14. What number should be subtracted fram each of the numbers $23,30,57$ and 78 , so that the remainders are in proportion?
15. What should be added to each of the numbers 13,17 and 22 so that the resulting numbers are in continued proportion?

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16. if $\left(a^{2}+c^{2}\right),(a b+c d)$ and $\left(b^{2}+d^{2}\right)$ are in continued proportion, prove that $a, b, c$ and $d$ are in proportion.

## - Watch Video Solution

17. if $p: q:: r$, prove that $p: r=p^{2}: q^{2}$.

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18. if $a \neq b$ and $a: b$ is the duplicate ratio of $a+c$ and $b+c$, prove that ' $c$ ' is the mean proportional between ' $a$ ' and ' $b$ '.

## - Watch Video Solution

19. if $a+c=m b$ and $\frac{1}{b}+\frac{1}{d}=\frac{m}{c}$, prove that $a, b, c$ and $d$ are in proportion.

## - Watch Video Solution

20. if $q$ is the mean proportional between $p$ and $r$, prove that :
$p^{2}-q^{2}+r^{2}=q^{4}\left(\frac{1}{p^{2}}-\frac{1}{q^{2}}+\frac{1}{r^{2}}\right)$.

## - Watch Video Solution

21. if $a, b, c$ and $d$ are in proportion, prove that :
(i) $\frac{a-b}{c-d}=\sqrt{\frac{3 a^{2}+8 b^{2}}{3 c^{2}+8 d^{2}}}$
(ii) $\left(\frac{5 a^{2}+12 c^{2}}{5 b^{2}+12 d^{2}}\right)=\sqrt{\frac{3 a^{4}-7 c^{4}}{3 b^{4}-7 d^{4}}}$

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22. 6 is the mean proportion between two numbers $x$ and $y$ and 48 is third proportion to $x$ and $y$. Find the numbers.

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23. if $\frac{8 x+l 3 y}{8 x-13 y}=\frac{9}{7}$, find $x: y$.

## - Watch Video Solution

24. 

$a: b=e: d$,
show
$3 a+2 b: 3 a-2 b=3 c+2 d: 3 c-2 d$.

## - Watch Video Solution

25. if $\frac{8 a-5 b}{8 c-5 d}=\frac{8 a+5 b}{8 c+5 d}$, prove that $\frac{a}{b}=\frac{c}{d}$.

## D Watch Video Solution

26. if $p=\frac{4 x y}{x+y}$, find the value of $\frac{p+2 x}{p-2 x}+\frac{p+2 y}{p-2 y}$.

## - Watch Video Solution

27. if $a: b=c: d$ prove that :
$\left(a^{2}+a c+c^{2}\right):\left(a^{2}-a c+c^{2}\right)=\left(b^{2}+b d+d^{2}\right):\left(b^{2}-b d+d^{2}\right)$
28. if $x, y$ and $z$ are in continued proportion, prove that : $x^{2}-y^{2}: x^{2}+y^{2}=x-z: x+z$.

## - Watch Video Solution

29. Using the properties of proportion, solve the following equation for $x$ :
$\frac{x^{3}+3 x}{3 x^{2}+1}=\frac{341}{91}$

## D Watch Video Solution

30. if $\quad x=\frac{\sqrt{3 a+2 b}+\sqrt{3 a-2 b}}{\sqrt{3 a+2 b}-\sqrt{3 a-2 b}}$ prove that :
$b x^{2}-3 a x+b=0$

# Multiple Choice Question 

1. If $2 x+3 y: 3 x+5 y=18: 29$, then the ratio $x: y$ is:
A. $2: 3$
B. 3: 5
C. 3: 4
D. $5: 29$

## Answer: C

## D View Text Solution

2. If $x: y=2: 3$, then the value of $(7 x-4 y):(5 x+2 y)$ is:
A. $1: 8$
B. 2: 3
C. $4: 9$
D. 5:7

## Answer: A

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3. If $x: y=5: 3$, then the value of $(8 x-5 y):(6 x+7 y)$
A. $24: 27$
B. $35: 37$
C. 25: 9
D. $25: 51$
4. The simplest form of the ratio $27: 81$ is:
A. $1: 3$
B. 3:9
C. 27: 81
D. $9: 27$

## Answer: A

5. Which of the following ratio is same as $2: 5$ ?
A. $6: 18$
B. 14: 49
C. $10: 25$
D. 9: 24

## Answer: C

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6. The ratio $\frac{2}{3}: \frac{1}{9}$ in its simplest form is:
A. $1: 3$
B. 2: 1
C. 6: 1
D. 2: 9

## Answer: C

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7. The ratio between 3.6 m and 75 cm is:
A. $18: 275$
B. 24:5
C. $6: 125$
D. $4: 5$

## Answer: B

## - View Text Solution

8. If $x: y=2: 9$ and $y: z=3: 5$, then $x: z$ is:
A. $2: 15$
B. $4: 15$
C. 6:5
D. 2: 5

## Answer: A

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9. If $a: b=\frac{1}{2}: \frac{3}{8}$ and $b: c=\frac{1}{3}: \frac{5}{9}$ then $a: c$ is:
A. $1: 9$
B. 1: 4
C. 2:3
D. $4: 5$

## D View Text Solution

10. If $4 x=7 y=9 z$, then $x: y: z$
A. $24: 31: 19$
B. $63: 36: 28$
C. $4: 7: 9$
D. $16: 49: 81$

## Answer: B

## - View Text Solution

11. If $\mathrm{x}: \mathrm{y}=3: 2$, then $\left(3 x^{2}+2 y^{2}\right):\left(3 x^{2}-2 y^{2}\right)$ is
A. $17: 13$
B. $45: 23$
C. 27: 8
D. $35: 19$

## Answer: D

## - View Text Solution

12. If $\mathrm{a}: \mathrm{b}=3: 2$, then $(a+b)^{2}:(a-b)^{2}$ is:
A. $9: 4$
B. $1: 25$
C. 25: 1
D. $4: 9$

## Answer: C

## - View Text Solution

13. If $\frac{3 x+5 y}{3 x-5 y}=\frac{7}{3}$, then $\mathrm{x}: \mathrm{y}$ is
A. $25: 6$
B. 7:3
C. 9: 49
D. $10: 4$

## Answer: A

D View Text Solution
14. If $x^{2}+4 y^{2}=4 x y$,then $\mathrm{x}: \mathrm{y}$ is
A. $1: 4$
B. $4: 1$
C. 2: 1
D. $1: 2$

## Answer: C

## - View Text Solution

15. The ratios $2: 3,8: 15,11: 12,7: 16$ in their ascending order of magnitude are:
A. $\frac{2}{3}<\frac{7}{16}<\frac{8}{15}<\frac{11}{12}$
B. $\frac{7}{16}<\frac{8}{15}<\frac{2}{3}<\frac{11}{12}$
c. $\frac{7}{16}<\frac{8}{15}<\frac{7}{12}<\frac{2}{3}$
D. $\frac{2}{3}<\frac{11}{12}<\frac{8}{15}<\frac{7}{16}$

## - View Text Solution

16. If $\left(2 x^{2}-5 y^{2}\right): x y=1: 3$, then $\mathrm{x}: \mathrm{y}$ is
A. $3: 2$
B. $-5: 3$
C. $5: 3$
D. $-3: 2$

## Answer: C

## D View Text Solution

17. If $m: n=5: 3$ then $\left(m^{2}+n^{2}\right):\left(m^{2}-n^{2}\right)$ is
A. $17: 8$
B. 15:7
C. 8: 17
D. $7: 15$

## Answer: A

## - View Text Solution

18. If $\left(x^{2}+y^{2}\right):\left(x^{2}-y^{2}\right)=17: 8$ then $\mathrm{x}: \mathrm{y}$ is
A. $3: 7$
B. $25: 9$
C. $8: 17$
D. $5: 3$
19. The duplicate ratio of $\sqrt{3}: 7$ is
A. $3: 49$
B. $7: \sqrt{3}$
C. $2 \sqrt{3}: 14$
D. $(\sqrt{3}+2): 9$

## Answer: A

## - View Text Solution

20. The triplicate ratio of $1: 3$ is :
A. $3: 9$
B. 1:27
C. $3: 9$
D. 3:1

## Answer: B

## - View Text Solution

21. The sub-duplicate ratio of 25 : 16 is:
A. $16: 25$
B. $23: 14$
C. $\frac{25}{2}: 8$
D. 5: 4

## - View Text Solution

22. The sub-triplicate ratio of 64: 343 is:
A. $16: 17$
B. $61: 340$
C. $4: 7$
D. $\frac{64}{3}: \frac{343}{3}$

## Answer: C

- View Text Solution

23. The duplicate ratio of $\frac{1}{9}: 2$ is
A. $9: \frac{1}{2}$
B. 18: 1
C. 9:2
D. 2: 18

## Answer: B

## - View Text Solution

24. The compounded ratio of $2: 3$ and $5: 9$ is:
A. $10: 27$
B. 6: 45
C. 18: 15
D. $7: 12$
25. The mean proportional between 4 and 9 is:
A. $\frac{5}{2}$
B. $\frac{13}{2}$
C. 6
D. 13

## Answer: C

- View Text Solution

26. The ratio compounded of the duplicate of $7: 6$, sub-duplicate of $25: 49$ and the reciprocal of $35: 36$ is:
A. 1:1
B. $2: 3$
C. $4: 7$
D. $5: 9$

## Answer: A

## D View Text Solution

27. If $(2 x+5):(8 x+9)$ is the duplicate ratio of $3: 5$, then the value of $x$ is:
A. 4
B. 1
C. 3
D. 2

## Answer: C

## - View Text Solution

28. If $(9 x+10):(4 x+3)$ is the triplicate ratio of $4: 3$, then the value of $x$ is:
A. 5
B. 6
C. 4
D. 3
29. The fourth proportional to $0-4,2$ and 10 is:
A. 50
B. 12.5
C. 2
D. 15

## Answer: A

## - View Text Solution

30. The third proportional to 2 and 7 is:
A. $\sqrt{14}$
B. 24.5
C. 14
D. 9

## Answer: B

## - View Text Solution

31. If $a, b, c$ and dare in proportional, then $\sqrt{\frac{3 a^{2}+8 b^{2}}{3 c^{2}+8 d^{2}}}$ is equal to
A. $\frac{c}{a}$
B. $\frac{b}{d}$
C. $\frac{a}{b}$
D. $\frac{c}{d}$

## Answer: B

## D View Text Solution

32. If $\frac{x^{3}+12 x}{6 x^{2}+8}=\frac{y^{3}+27 y}{9 y^{2}+27}$ then using componendo and dividendo, the ratio $x: y$ is equal to:
A. $2: 3$
B. $12: 27$
C. 1:3
D. 3: 4

Answer: A
33. If $\frac{2 x+\sqrt{4 x^{2}-1}}{2 x-\sqrt{4 x^{2}-1}}=4$ then using the properties of proportion, the value of $x$ is
A. $\frac{1}{2}$
B. $\frac{5}{8}$
C. $\frac{8}{5}$
D. $\frac{6}{5}$

## Answer: B

## - View Text Solution

34. If the numbers $p+3, p+2,3 p-7$ and $2 p-3$ are in proportion, then the value of $p$ is:
A. -1
B. 1
C. 5
D. -5

## Answer: C

## - View Text Solution

35. If $\frac{x^{2}+2 x}{2 x+4}=\frac{y^{2}+3 y}{3 y+9}$ then the value of $2 \mathrm{x}: 3 \mathrm{y}$ is
A. $16: 27$
B. 1: 1
C. 2:3
D. $4: 9$

## - View Text Solution

36. If $\frac{\sqrt{3 x+4}+\sqrt{3 x-5}}{\sqrt{3 x+4}-\sqrt{3 x-5}}=9$ then using the properties of proportion, the value of $x$ is
A. 2
B. 7
C. 4
D. 9

## Answer: B

37. If 6 is the mean proportion between the two numbers $x$ and $y$, and 48 is the third proportion of $x$ and $y$, then the numbers $x$ and y respectively, are:
А. 3,12
B. 6,6
C. 4,9
D. 9,4

## Answer: A

## - View Text Solution

38. If $\mathrm{x}=\frac{\sqrt{a+1}+\sqrt{a-1}}{\sqrt{a+1}-\sqrt{a-1}}$ then using properties of proportion $x^{2}-2 a x+1=$
A. a
B. 1
C. 0
D. 2 a

## Answer: C

## - View Text Solution

39. The number that must be added to each of the numbers 6,15 ,

20 and 43 to make them proportional is:
A. 0
B. 1
C. 2
D. 3
A. 75
B. 65
C. 55
D. 50

## Answer: A

## - View Text Solution

41. The fourth proportional to $\frac{1}{3}, \frac{1}{4}$ and $\frac{1}{5}$ is
A. $\frac{3}{10}$
B. $\frac{3}{20}$
C. $\frac{3}{25}$
D. 10

## Answer: B

## - View Text Solution

42. If $x+3$ is the mean proportion between $X+2$ and $x+9$, then the value of $x$ is
A. $-\frac{9}{5}$
B. $\frac{9}{5}$
C. $\frac{5}{9}$
D. $-\frac{5}{9}$

## - View Text Solution

43. If $\frac{\sqrt{5 x}+\sqrt{2 x-6}}{\sqrt{5 x}-\sqrt{2 x-6}}=4$ then the value of x is
A. 20
B. 10
C. 30
D. 40

## Answer: C

44. If the mean proportion between two numbers is 4 and the third proportional to them is also 4, then the two numbers are and.
A. 4,3
B. 4,2
C. 4,4
D. 4,5

## Answer: C

## D View Text Solution

45. If $(x-2),(x+2),(2 x+1)$ and $(2 x+19)$ are in proportion, then the value of $x$ is
A. 5
B. 6
C. 3
D. 4

## Answer: D

## - View Text Solution

46. Assertion : The number that must be subtracted from each of the numbers $78,57,30$ and 23 , so that the remainders are in proportion, is 6.

Reason: If $\mathrm{a}, \mathrm{b}, \mathrm{c}$ and d are proportion, then $\frac{a}{b}=\frac{c}{d}$
A. Both assertion and reason are correct and reason in the
B. Both assertion and reason are correct but reason is not the correct explanation of assertion
C. Assertion is correct but reason is incorrect
D. Assertion is incorrect but reason is correct

## Answer: A

## - View Text Solution

47. Assertion : If y is the mean proportion between x and z then
xyz $(y+y+z)^{3}=(x y+y z+z x)^{3}$
Reason : If $y$ is the mean proportion between $x$ and $z$ then
$y=\frac{x+z}{2}$
A. Both assertion and reason are correct and reason in the
B. Both assertion and reason are correct but reason is not the correct explanation of assertion
C. Assertion is correct but reason is incorrect
D. Assertion is incorrect but reason is correct

## Answer: C

## - View Text Solution

48. Assertion : If $\frac{x}{a}=\frac{y}{b}=\frac{z}{c}$ then $\frac{x^{3}}{a^{3}}+\frac{y^{3}}{b^{3}}+\frac{z^{3}}{c^{3}}=\frac{3 x y z}{a b c}$

Reason : If $\mathrm{a}, \mathrm{b}, \mathrm{c}$, and d are in proportion, then $\frac{a}{b}=\frac{c}{b}$
A. Both assertion and reason are correct and reason in the correct explanation of assertion
B. Both assertion and reason are correct but reason is not the correct explanation of assertion
C. Assertion is correct but reason is incorrect
D. Assertion is incorrect but reason is correct

## Answer: B

## - View Text Solution

49. Assertion : If $(4 a+56)(4 c-5 d)(4 a-5 b)(4 c+5 d)$, then $a, b, d$ are in proportion.

Reson : If $\frac{x}{y}=\frac{m}{n}$ then $\mathrm{x}, \mathrm{y}, \mathrm{m}$,are in proportion
A. Both assertion and reason are correct and reason in the correct explanation of assertion
B. Both assertion and reason are correct but reason is not the correct explanation of assertion
C. Assertion is correct but reason is incorrect
D. Assertion is incorrect but reason is correct

## Answer: D

## - View Text Solution

50. Assertion : If $\frac{x^{3}+3 x y^{2}}{y^{3}+3 x^{2} y}=\frac{63}{62}$, then $\mathrm{x}: \mathrm{y}=3: 2$

Reason : The triplicate ratio of $\mathrm{x}: \mathrm{y}$ is $x^{3}+y^{3}$
A. Both assertion and reason are correct and reason in the correct explanation of assertion
B. Both assertion and reason are correct but reason is not the correct explanation of assertion
C. Assertion is correct but reason is incorrect
D. Assertion is incorrect but reason is correct

## Answer: B

## - View Text Solution

51. Assertion : Let $a$ : be the duplicate ratio of $a+c$ and $b+c$.

Then b is the third proportion between a and c .

Reason: If y is the third proportion between x and z , then $\frac{x}{y}=\frac{y}{2}$
A. Both assertion and reason are correct and reason in the
B. Both assertion and reason are correct but reason is not the correct explanation of assertion
C. Assertion is correct but reason is incorrect
D. Assertion is incorrect but reason is correct

## Answer: B

## - View Text Solution

52. To teach the chapter ratio and proportion in a class, the teacher asked the students of class $X$ to make two groups of boys and girls to find the number of boys and girls. Class $X$ has three sections A, B and C. The number of boys and girls in the three sections were found to be 24 and 32,27 and 39 and 28 and 35 , respectively.

What is the ratio of number of boys and girls in section A?
A. $9: 13$
B. 3: 4
C. $4: 3$
D. $13: 9$

## Answer: B

## - View Text Solution

53. To teach the chapter ratio and proportion in a class, the teacher asked the students of class $X$ to make two groups of boys and girls to find the number of boys and girls. Class $X$ has three sections A, B and C. The number of boys and girls in the three sections were found to be 24 and 32,27 and 39 and 28 and 35 , respectively.

What is the ratio of number of boys and girls in section $B$ ?
A. $3: 5$
B. $4: 5$
C. 3: 4
D. 9: 13

## Answer: D

## - View Text Solution

54. To teach the chapter ratio and proportion in a class, the teacher asked the students of class $X$ to make two groups of boys and girls to find the number of boys and girls. Class $X$ has three sections A, B and C. The number of boys and girls in the three sections were found to be 24 and 32,27 and 39 and 28 and 35 , respectively.

What is the ratio of number of girls and boys in section $C$ ?
A. $4: 5$
B. 3: 13
C. 5: 4
D. $3: 5$

## Answer: C

## - View Text Solution

55. To teach the chapter ratio and proportion in a class, the teacher asked the students of class X to make two groups of boys and girls to find the number of boys and girls. Class $X$ has three sections $A, B$ and $C$. The number of boys and girls in the three sections were found to be 24 and 32,27 and 39 and 28 and 35 , respectively.

What is the duplicate ratio of number of boys and girls in section C?
A. $16: 25$
B. $9: 169$
C. $25: 16$
D. 9: 25

## Answer: A

## D View Text Solution

56. To teach the chapter ratio and proportion in a class, the teacher asked the students of class $X$ to make two groups of boys and girls to find the number of boys and girls. Class $X$ has three sections A, B and C. The number of boys and girls in the three sections were found to be 24 and 32,27 and 39 and 28 and

## 35 , respectively.

What is the reciprocal ratio of number of girls and boys in section C?
A. $5: 4$
B. $13: 3$
C. $4: 5$
D. $5: 3$

## Answer: C

## - View Text Solution

57. Age-gender structure is one of the most important characteristics of population composition. Almost all population characteristics vary significantly with age. Age statistics form an important component of population analysis. The usefulness of
age data is more noticeable when it is cross classified by variables like marital status, literacy, economic activity which vary with age in different patterns.

Suppose census report the population (approx.) of different age groups in the year 2020.


What is the ratio of population of the three age groups ?
A. $24: 16: 13$
B. $13: 16: 24$
C. 16: 24: 13
D. $13: 24: 16$
58. Age-gender structure is one of the most important characteristics of population composition. Almost all population characteristics vary significantly with age. Age statistics form an important component of population analysis. The usefulness of age data is more noticeable when it is cross classified by variables like marital status, literacy, economic activity which vary with age in different patterns.

Suppose census report the population (approx.) of different age groups in the year 2020.


If $r$ is the fourth proportional of the numbers of the ratio, obtained in (i), then the value of $x$
A. $\frac{24}{5}$
B. $\frac{29}{2}$
C. $\frac{26}{3}$
D. $\frac{39}{4}$

## Answer: C

## - View Text Solution

59. Age-gender structure is one of the most important characteristics of population composition. Almost all population characteristics vary significantly with age. Age statistics form an important component of population analysis. The usefulness of age data is more noticeable when it is cross classified by variables like marital status, literacy, economic activity which vary with age in different patterns.

Suppose census report the population (approx.) of different age
groups in the year 2020.


If y is the mean population to 48 and 36 , then the value of y is :
A. 42
B. 24
C. 6
D. 12

## Answer: D

60. Age-gender structure is one of the most important characteristics of population composition. Almost all population characteristics vary significantly with age. Age statistics form an important component of population analysis. The usefulness of age data is more noticeable when it is cross classified by variables like marital status, literacy, economic activity which vary with age in different patterns.

Suppose census report the population (approx.) of different age
groups in the year 2020.


If $z$ is the third proportion to 9 and 15 , then the value of $z$ is
A. 24
B. 25
C. 12
D. 6

## Answer: B

## D View Text Solution

61. Age-gender structure is one of the most important characteristics of population composition. Almost all population characteristics vary significantly with age. Age statistics form an important component of population analysis. The usefulness of age data is more noticeable when it is cross classified by variables like marital status, literacy, economic activity which vary with age in different patterns.

Suppose census report the population (approx.) of different age groups in the year 2020.


The compounded ratio of $3: 8$ and $4: 9$ is
A. $1: 6$
B. $7: 17$
C. $1: 1$
D. $34: 89$

## Answer: A

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