



MATHS

BOOKS - SELINA MATHS (ENGLISH)

GEOMETRIC PROGRESSION

Questions

1. Find which of the following is a G.P. :

2, $2\sqrt{2}$, 4, $4\sqrt{2}$,



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2. Find which of the following is a G.P. :

$$\frac{1}{3}, \frac{2}{3}, 1, \frac{4}{3}, \dots\dots\dots$$



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3. Find which of the following is a G.P. :

$$4, 8, 16, \dots\dots\dots$$



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4. Find which of the following is a G.P. :

xy, x^2y, x^3y, \dots



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5. Find the 8^{th} term of the geometric progression : 5,10 20,



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6. Find the 19^{th} term of the series :

$$\sqrt{3} + \frac{1}{\sqrt{3}} + \frac{1}{3\sqrt{3}} + \dots\dots\dots$$



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7. If the first two consecutive terms of a G.P. are 125 and 25, find its 6^{th} term.



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8. Find the next three terms of the sequence :

36,12,4,.....



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9. Find which term of G.P. $3 - 6 + 12 - 24 + ..$

..... is -384 ?



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10. find the G.P. whose 5^{th} term is 48 and 8^{th} term is 384.



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11. If the 3^{rd} term of a G.P. is 4, find the product of its first five terms.



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12. The first term of a G.P. is 1. The sum of its third and fifth terms of 90. Find the common ratio of the G.P.



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13. If the 4^{th} , 7^{th} and 10^{th} terms of a G.P. are a, b and c respectively, prove that : $b^2 = ac$



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14. If the p^{th} , q^{th} and r^{th} terms of a GP are a, b and c, respectively. Prove that

$$a^{q-r} b^{r-p} c^{p-q} = 1.$$



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15. If a, b and c are A.P. whereas x, y and z are in G.P. :

Prove that : $x^{b-c} \cdot y^{c-a} \cdot z^{a-b} = 1.$



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16. Find the sum of 10 terms of the series :

$$96 - 48 + 24. \dots \dots \dots$$



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17. Find the sum of 8 terms of the G.P. :

$$3 + 6 + 12 + 24 + \dots \dots \dots$$



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18. Find the sum of the geometric series :

$$1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \dots \text{ upto 12 terms.}$$



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19. Find the sum of 10 terms of the geometric

progression :

$$1 + \sqrt{3} + 3 + 3\sqrt{3} + \dots$$



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20. How many terms of the G.P.

$\frac{2}{9}, -\frac{1}{3}, \frac{1}{2}, \dots$ must be added to
get the sum equal to $\frac{55}{72}$?



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21. Find the sum of the G.P. :

$2 + 6 + 18 + 54 + \dots + 4374.$



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22. A G.P. has first term $a = 3$, last term $l = 96$ and sum of n terms $S = 189$. Find the number of terms in it.



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23. Find the geometric mean between
3 and 12



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24. Find the geometric mean between

3 and 243 .



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Exercise 11 A

1. Check whether the given sequences form a

G.P. or not :

8 , 24 , 72 , 216 ,



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2. Check whether the given sequences form a

G.P. or not :

$$\frac{1}{8}, \frac{1}{24}, \frac{1}{72}, \frac{1}{216}, \dots$$



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3. Check whether the given sequences form a

G.P. or not :

$$9, 12, 16, 24, \dots$$



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4. Find the 9th term of the series :

1,4,16,64



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5. Find the seventh term of the G.P. :

1, $\sqrt{3}$, 3, $3\sqrt{3}$



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6. Find the 8^{th} term of the sequence :

$$\frac{3}{4}, 1\frac{1}{2}, 3, \dots\dots\dots$$



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7. Find the 10^{th} term of the G.P. :

$$12, 4, 1\frac{1}{3}, \dots\dots\dots$$



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8. Find the n^{th} term of the series :

1, 2, 4, 8,



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9. Find the next three terms of the sequence :

$\sqrt{5}$, 5, $5\sqrt{5}$,



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10. Find the sixth term of the series :

$$2, 2^2, 2^3, 2^4, \dots\dots\dots$$

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11. Find the seventh term of the G.P. :

$$\sqrt{3} + 1, 1, \frac{\sqrt{3} - 1}{2}, \dots\dots\dots$$

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12. Find the G.P. whose first term is 64 and next term is 32.



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13. Find the next three terms of the series :

$$\frac{2}{27}, \frac{2}{9}, \frac{2}{3}, \dots\dots\dots$$



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14. Find the next two terms of the series :

$$2 - 6 + 18 - 54. \dots\dots\dots$$

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Exercise 11 B

1. Which term of the G.P. :

$$-10, \frac{5}{\sqrt{3}}, -\frac{5}{6}, \dots\dots\dots \text{ is } -\frac{5}{72} ?$$

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2. The fifth term of a G.P. is 81 and its second term is 24. Find the geometric progression.



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3. Fourth and seventh terms of a G.P. are $\frac{1}{18}$ and $-\frac{1}{486}$ respectively. Find the G.P.



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4. If the first and the third terms of a G.P. are 2 and 8 respectively, find its second term.



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5. The product of 3^{rd} and 8^{th} terms of a G.P. is 243. If its 4^{th} term is 3, find its 7^{th} term.



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6. Find the geometric progression with fourth term = 54 seventh term = 1458.



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7. Second term of a geometric progression is 6 and its fifth term is 9 times of its third term. Find the geometric progression. Consider that each term of the G.P. is positive.



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8. The fourth term, the seventh term and the last term of a geometric progression are 10, 80 and 2560 respectively. Find its first term, common ratio and number of terms.



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9. If the fourth and ninth terms of a G.P. are 54 and 13122 respectively, find the G.P. Also find its general term.



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10. The fifth , eighth and eleventh terms of a geometric progression are p, q and r respectively. Show that : $q^2 = pr$.



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Exercise 11 C

1. Find the seventh term from the end of the series : $\sqrt{2}, 2, 2\sqrt{2}, \dots, 32$.



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2. Find the third term from the end of the G.P.

$$\frac{2}{27}, \frac{2}{9}, \frac{2}{3}, \dots, 162.$$



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3. For the G.P. $\frac{1}{27}, \frac{1}{9}, \frac{1}{3}, \dots, 81,$

find the product of fourth term from the beginning and the fourth term from the end.



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4. If a , b , and c are respectively, the p th, q th, and r th terms of a G.P., show that $(q - r)\log a + (r - p)\log b + (p - q)\log c = 0$.



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5. If a, b and c are in G.P., prove that $\log a$, $\log b$ and $\log c$ are in A.P.



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6. If each term of a G.P. is raised to the power x , show that the resulting sequence is also a G.P.



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7. If a, b and c are in A.P. a, x, b are in G.P. whereas b, y and c are also in G.P. Show that : x^2, b^2, y^2 are in A.P.



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8. If a, b, c are in G.P. and a, x, b, y, c are in A.P.,

prove that :

$$\frac{1}{x} + \frac{1}{y} = \frac{2}{b}$$



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9. If a, b, c are in G.P. and a, x, b, y, c are in A.P.,

prove that :

$$\frac{a}{x} + \frac{c}{y} = 2.$$



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10. If a, b and c are in A.P. and also in G.P., show that : $a = b = c$.



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Exercise 11 D

1. Find the sum of G.P. :

$1 + 3 + 9 + 27 + \dots$ to 12 terms.



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2. Find the sum of G.P. :

$$0 \cdot 3 + 0 \cdot 03 + 0 \cdot 003 + 0 \cdot 0003 + \dots\dots\dots$$

to 8 terms.



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3. Find the sum of G.P. :

$$1 - \frac{1}{2} + \frac{1}{4} - \frac{1}{8} + \dots\dots\dots \text{ to 9 terms .}$$



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4. Find the sum of G.P. :

$$1 - \frac{1}{3} + \frac{1}{3^2} - \frac{1}{3^3} + \dots \text{ to } n \text{ terms.}$$



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5. Find the sum of G.P. :

$$\frac{x + y}{x - y} + 1 + \frac{x - y}{x + y} + \dots \text{ upto } n \text{ terms.}$$



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6. Find the sum of G.P. :

$$\sqrt{3} + \frac{1}{\sqrt{3}} + \frac{1}{3\sqrt{3}} + \dots \text{ to } n \text{ terms.}$$



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7. How many terms of the geometric progression $1 + 4 + 16 + 64 + \dots$ must be added to get sum equal to 5461 ?



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8. If the first term of a G.P is 27 and 8th term is

$\frac{1}{81}$, then the sum of its first 10 terms is (i)

$\frac{27}{2} \left(1 - \frac{1}{3^{10}} \right)$ (ii) $\frac{81}{2} \left(\frac{1}{3^{10}} - 1 \right)$ (iii)

$\frac{27}{2} \left(\frac{1}{3^{10}} - 1 \right)$ (iv) $\frac{81}{2} \left(1 - \frac{1}{3^{10}} \right)$



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9. A boy spends Rs. 10 on first day, Rs. 20 on second day, Rs. 40 on third day and so on. Find how much, in all, will he spend in 12 days ?



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10. The 4^{th} and the 7^{th} terms of a G.P. are $\frac{1}{27}$ and $\frac{1}{729}$ respectively. Find the sum of n terms of this G.P.



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11. A geometric progression has common ratio = 3 and last term = 486. If the sum of its terms is 728, find its first term.



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12. Find the sum of G.P. : 3,6,12,, 1536.



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13. How many terms of the series $2 + 6 + 18 + \dots$ Must be taken to make the sum equal to 728 ?



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14. In a G.P., the ratio between the sum of first three terms and that of the first six terms is 125: 152.

Find its common ratio.



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15. How many terms of the G.P.

$\frac{2}{9}, -\frac{1}{3}, \frac{1}{2}, \dots$ must be added to get the sum equal to $\frac{55}{72}$?



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16. If the sum of $1 + 2 + 2^2 + \dots + 2^{n-1}$ is 255, find the value of n.



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17. Find the geometric mean between :

$$\frac{4}{9} \text{ and } \frac{9}{4}$$



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18. Find the geometric mean between :

14 and $\frac{7}{32}$



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19. Find the geometric mean between :

$2a$ and $8a^3$



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20. The sum of three numbers in G.P. is $\frac{39}{10}$

and their product is 1. Find the numbers.



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21. The first term of a G.P. is -3 and the square of the second term is equal to its 4^{th} term. Find its 7^{th} term.



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22. Find the 5^{th} term of the G.P. $\frac{5}{2}, 1, \dots$



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23. The first two terms of a G.P. are 125 and 25 respectively. Find the 5^{th} and the 6^{th} terms of the G.P.



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24. Find the sum of the sequence $-\frac{1}{3}, 1, -3, 9, \dots$ Upto 8 terms.



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25. The first term of a G.P. is 27. If the 8^{th} term be $\frac{1}{81}$, what will be the sum of 10 terms ?



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26. Find a G.P. for which the sum of first two terms is -4 and the fifth is 4 times the third term.



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