



### MATHS

## **BOOKS - KALYANI PUBLICATION**

# PROGRESSION



**1.** Examine whether the following sequences are in A.P. If it is so, determine its first term and

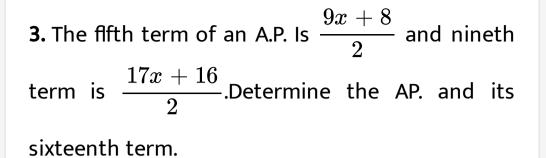
common difference.

$$T_n = 4n + 3$$



in A.P. If it is so, determine its first term and common difference.

$$T_n = n^2 + 3$$





4. The sum of three numbers in A.P. is 24 and the

sum of their squares is 224. Find the number.



5. If pth, qth and rth term of an A.P. be a,b,c then prove that.

$$a(q-r) + b(r-p) + c(p-q) = 0$$

$$a^3 - 8b^3 + c^3 + 6abc = 0$$

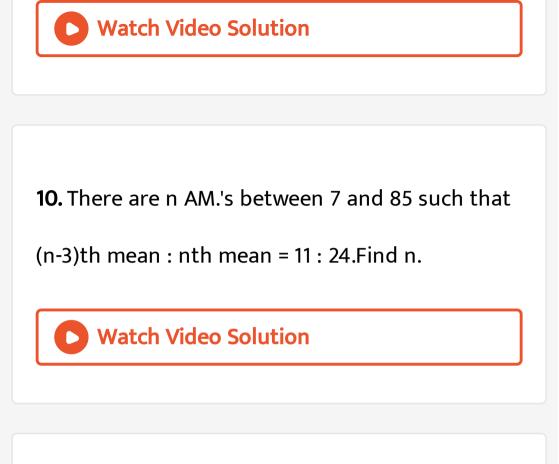


7. If a, b, c are in A.P., prove that  $\frac{1}{\sqrt{b} + \sqrt{c}}, \frac{1}{\sqrt{c} + \sqrt{a}}, \frac{1}{\sqrt{a} + \sqrt{b}}$  are also in A.P.

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8. If 
$$(b-c)^2$$
,  $(c-a)^2$ ,  $(a-b)^2$  are in A.P. show  
that  $\frac{1}{b-c}$ ,  $\frac{1}{c-a}$ ,  $\frac{1}{a-b}$  are also in A.P.

9. Determine five arithmetic mean between 3 and



**11.** Find the sum of -7-4-1 + 2.... to 20th term.

**12.** Prove that the sum of n A.M.'s between any two numbers is equal to n times the A.M. of the two numbers.



**13.** The first term and the last term of an A.P. are 2 and 29, respectively. If the sum of the series is 155, find the number of terms and common difference.



14. If the sums of an A.P. upto pth, qth and rth

terms are a, b and c respectively, prove that-

$$rac{a}{p}(q-r)+rac{b}{q}(r-p)+rac{c}{r}(p-q)=0.$$



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15. Find the sum of first n terms of the series

1.3 + 2.5 + 3.7 + 4.9 +....



**16.** The nth term of a sequence is given by  $\frac{2^{n+1}}{3^n}$ .

Prove that it is a geometric sequence. Also find

the first term and common ratio of it.



**17.** If fifth term of a G.P. is 16 and tenth term is  $\frac{1}{2}$ ,

find the G.P. Also find its fifteenth term.



18. The sum of three consecutive number in G.P. is

26 and their product is 216. Find the numbers.



**19.** If 2, a, b, 8 are in A.P. and a, b, c are in G.P., find

a, b, c.

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20. a, b, c are in G.P. If x, y are A.M.'s between a, b

and b, c respectively, prove that-

$$\frac{a}{x} + \frac{c}{y} = 2 \text{ and } \frac{1}{x} + \frac{1}{y} = \frac{2}{b}.$$
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21. If a,b,c,d are in G.P. then
$$\frac{1}{a^3 + b^3}, \frac{1}{b^3 + c^3}, \frac{1}{c^3 + d^3} \text{ are also in G.P.}$$
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**22.** Determine 3 G.M.,s between 2 and 162.



23. If 'a' be the AM of b and c and p and q be the

two G.M.,s between them, show that

$$p^3+q^3=2abc.$$



24. Find the sum to n term of the G.P

$$rac{1}{2} - rac{1}{4} + rac{1}{8} - rac{1}{16} + .....$$



25. In a G.P the sum of first n terms is S,the product is P and the sum of the reciprocals of the terms is R.Show that  $P^2 = \left(\frac{S}{R}\right)^n$ .



#### 26. Find the sum of first n terms of the following

 $4+44+444+\ldots$ 





**1.** Following are the nth terms of certain sequences. Determine first four terms in each case.

 $T_n = 3n + 1$ 

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**2.** Following are the nth terms of certain sequences. Determine first four terms in each case.

$$T_n = n^2 + n + 2$$

**3.** Following are the nth terms of certain sequences. Determine first four terms in each case.

$$T_n=rac{n^2+2n}{2}$$

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**4.** Following are the nth terms of certain sequences. Determine first four terms in each case.

$$T_n = \mathsf{1+}(\,-1)^n$$



**5.** Following are the nth terms of certain sequences. Determine first four terms in each case.

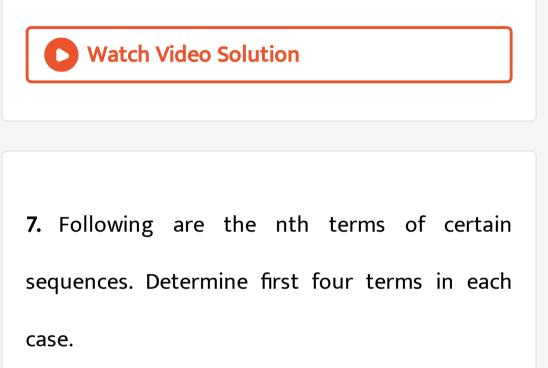
$$T_n=rac{\left(1
ight)^n}{2}$$



**6.** Following are the nth terms of certain sequences. Determine first four terms in each

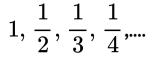
case.

$$T_n = (2n)^2$$

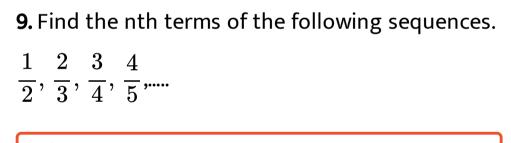


$$T_n=\left(rac{2}{3}
ight)^{n-1}$$

8. Find the nth terms of the following sequences.



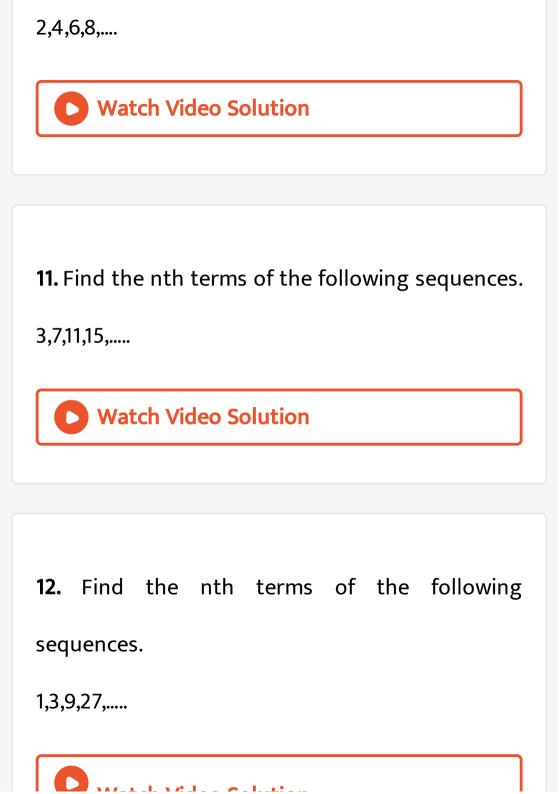
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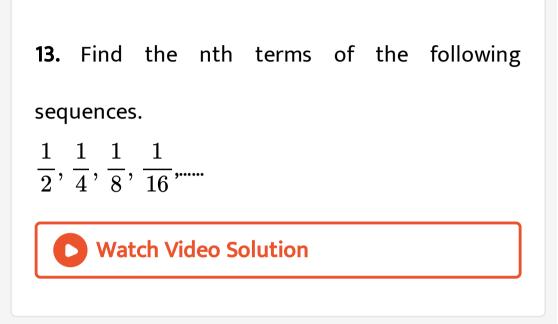
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10. Find the nth terms of the following

sequences.







14. the following are the nth term of certain sequence. Determine whether they are A.P. or not . If it is so find the first term and CD.  $T_n=n^2-1$ 



15. the following are the nth term of certain sequence. Determine whether they are A.P. or not . If it is so find the first term and CD.  $T_n=2n+3$ 



**16.** the following are the nth term of certain sequence. Determine whether they are A.P. or not

. If it is so find the first term and CD.  $T_n=3n+5$ 

17. the following are the nth term of certain sequence. Determine whether they are A.P. or not . If it is so find the first term and CD.  $T_n=n^2+n+2$ 

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18. the following are the nth term of certain sequence. Determine whether they are A.P. or not . If it is so find the first term and CD.  $T_n=3n-1$ 



**19.** The following are the nth terms of certain sequences. Determine whether they are A.P. or not. If it is so, find the first terms and common differences.

$$T_n = 4n - 10$$

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20. the following are the nth term of certain sequence. Determine whether they are A.P. or not . If it is so find the first term and CD.  $T_n = \frac{n^2 + 1}{2}$ 

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**21.** Determine the terms of the following A.P.'s as specified.

13th term of 7, 10, 13, ....

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**22.** Determine the terms of the following A.P.'s as specified.

100th term of 1, 3, 5, 7, ....



**23.** Determine the terms of the following A.P.'s as specified.

25th term of 3.1, 1.7, ....

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24. Determine the terms of the following A.P.'s as

specified.

nth term of (a - 3b), (a - b), (a + b)

25. Determine the terms of the following A.P.'s as

specified.

(n+1)th term of  $rac{1}{n}, rac{n+1}{n}, rac{2n+1}{n}$ 

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26. Determine the terms of the following A.P.'s as

specified.

17th term of -2,1,4,7,.....

27. Determine the terms of the following A.P.'s as

specified.

10th term of 408,404,400,.....

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**28.** Determine the terms of the following A.P.'s as specified.

10th term of 2,0,-2,-4,.....

29. Determine the terms of the following A.P.'s as

specified.

rth term of 20,18,16,.....

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**30.** The first term of an A.P. is 6 and common

difference is 2, then determine the l5th team.

31. The first term of an A.P. is 5 and the 11th term

, is 125 then determine the common difference.



32. The fourth term and eighth term of an A.P. are

2 and 10 respectively. Determine the A.P. and its

11th term.



33. The eighth term and 20th term of an A.P. are

22 and 46 respectively. Determine the first term,

common difference and 17th term of it.



34. the 7th term and 14 term of an A.P are - 9 and

- 23 respectively. Determine the first term and

common difference. which term of the A.P is -25

**35.** The fifth and nineth term of an A.P. are 7 and 11 respectively. Determine the A.P. which term of the A.P. is 2 ?



**36.** Which term of the A.P. 
$$-3\frac{1}{3}, -3, -2\frac{2}{3}$$
, is

zero?



37. Can zero be a term of an A.P. whose eleventh

term is 62 and 21th term is 32? (Hint : Taking the

nth term to be zero, find n)



**38.** The 4rth term and 15th term of an A.P is 22 and 66 respectively. Find the first term and the common difference.

**39.** The sixth term and 16th term of an A.P. are — 30 and zero respectively. The sum of a particular term with 26th term is the 21th term of the A.P. Determine the term.

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40. If 5 times the fifth term of an A.P. .is equal to 8

times its eight term, show that 13th term is zero.

41. If the 9th term of an A.P is zero, prove that

29th term is double the 19th term.



**42.** In a certain A.P., the 24th term is twice the 10th term. Prove that 72th term is twice of 34th term.



**43.** If the mth term and nth term of an A.P. are respectively n and m show that the (m + n)th term is zero and pth term is m + n - p.



**44.** The pth term of an A.P. is q and qth term is p.

Show that the nth term is p+q-n .



45. The pth term of an A.P. is -q and qth term is -

p. If the nth term is zero, find n.



**46.** The sum of the first term and pth term of an A.P. is zero. Show that the  $\left(\frac{p+1}{2}\right)$ th term is

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zero.

**47.** The sum of the pth and the qth term of an A.P. is equal to the sum of rth and sth term of it. Show that (p-r)th term and (s-q)th terms are equal

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48. If pth, qth and rth term of an A.P. are in A.P.,

show that p, q, r also are in A.P.

**49.** If the qth term of an A.P. is twice the pth term and rth term is twice the qth term. Prove that

$$-2p+r=3q$$

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#### 50. The sum of the pth and qth term of an A.P. is

one, and rth term is one. Show that the pth term

is 
$$\displaystyle rac{q-r}{p+q-2r}$$

51. The pth term of an A.P. is twice the qth term.

Again the sum of qth and rth term is 2. Prove

that the pth term is 
$$\displaystyle rac{4(q-p)}{3q-2p-r}$$

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**52.** The sum of three consecutive terms of an A.P. is 21 and their product is 315. Determine the numbers.

**53.** The sum of three consecutive terms of an A.P. is 36 and their product is 1620. Determine the numbers.



**54.** The sum of three consecutive terms of an A.P. is 54. If the product of the extremes is 275, determine the numbers.

55. The sum of three numbers in A.P. is 12. If the

sum of the squares is 56, then determine them.



**56.** Three integers are in A.P. If the product of the first and last is 60 and their difference is 4, determine them.



**57.** Divide 69 into three parts such that the parts may form as A.P. and the product of first two terms is 483.



**58.** Divide 72 into three parts such that the parts may form, an AP. and the product of the smaller parts is 480.

**59.** The product of three numbers in A.P. is 648. If the greatest is twice the least, then determine the numbers.



**60.** The sum of the squares of three numbers in A.P. is 116. If the greatest is twice the least, then find the numbers.

**61.** The sum of three numbers in A.P.is 30. If the product of the last two is three times the product of the first two then find the numbers.



**62.** The sum of four numbers in A.P. is 20 and sum of their squares is 120. Find the numbers.

Hint : Assume them as a-3d, a-d, a+d and

a + 3d.



**63.** The sum of four numbers in A.P. is 40. If the sum of the product of first and last term and two middle term is 160, find the numbers



**64.** If a, b, c are in A.P. then show that the terms given below are also in A.P.

b+c, c+a, a+b

65. If a, b, c are in A.P. then show that the terms

given below are also in A.P.

b+c-a, c+a-b, a+b-c

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66. If a, b, c are in A.P. then show that the terms

given below are also in A.P.

 $\frac{1}{bc}, \frac{1}{ca}, \frac{1}{ab}$ 

67. If a, b, c are in A.P. then show that the terms

given below are also in A.P.

$$a\left(\frac{1}{b}+\frac{1}{c}\right), b\left(\frac{1}{c}+\frac{1}{a}\right), c\left(\frac{1}{a}+\frac{1}{b}\right).$$

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**68.** If a, b, c are in A.P. then show that the terms given below are also in A.P.

$${\left( {b + c} 
ight)^2 - {a^2},\left( {c + a} 
ight)^2 - {b^2},\left( {a + b} 
ight)^2 - {c^2}.}$$

69. If a, b, c are in A.P. then show that the terms

given below are also in A.P.

 $a^2(b+c), b^2(c+a), c^2(a+b), \{ab+bc+ca
eq 0\}$ 



70. If  $a^2, b^2, c^2$  are in A.P., then the terms given

below are also in A.P.

$$rac{1}{b+c}, rac{1}{c+a}, rac{1}{a+b}.$$

**71.** If  $a^2, b^2, c^2$  are in A.P., then the terms given

below are also in A.P.

$$rac{a}{b+c},\,rac{b}{c+a},\,rac{c}{a+b}.$$

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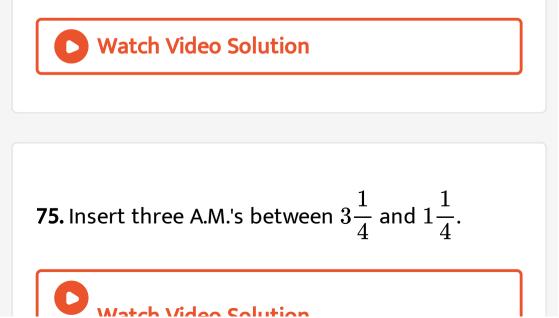
72. If 
$$\frac{1}{a}, \frac{1}{b}, \frac{1}{c}$$
 are in A.P. then  $\frac{b+c}{a}, \frac{c+a}{b}, \frac{a+b}{c}$  are also in A.P.

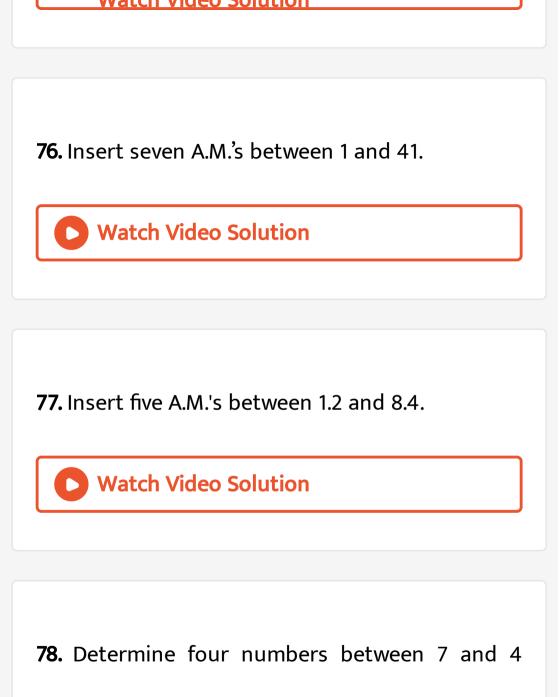
73. If 
$$\frac{1}{a+b}$$
,  $\frac{1}{b+c}$ ,  $\frac{1}{c+a}$  are in A.P., then  $c^2$ ,  $a^2$ ,  $b^2$  are in A.P.

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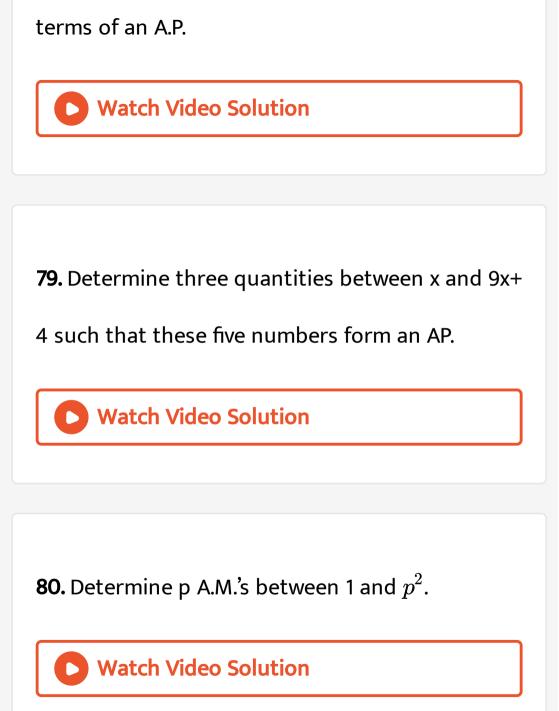
74. Insert three arithmetic mean between 2 and

14.





such that these six numbers are six consecutive



81. If  $\frac{a^n+b^n}{a^{n-1}+b^{n-1}}$  is the A.M. of a and b, then

find n.

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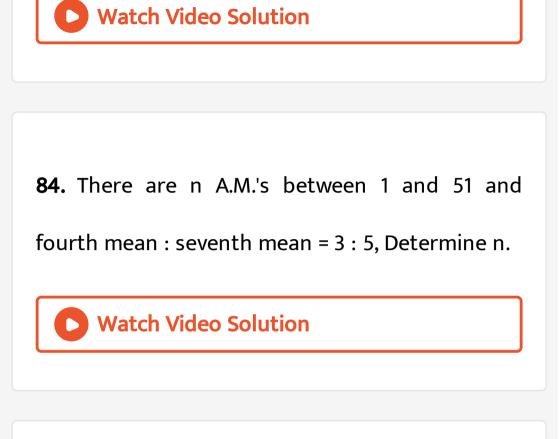
82. If 
$$\frac{a^{n+1}+b^{n+1}}{a^n+b^n}$$
 is the A.M. of a and b, then

find n.

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83. There are n A.M.'s between 5 and 35. If second

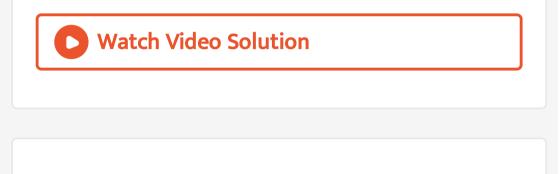
mean : last mean = 1 : 4, then find n.

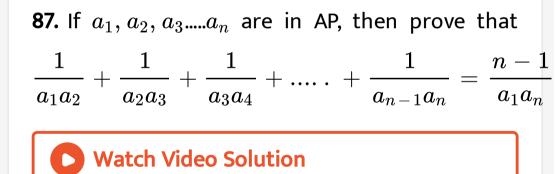


85. There are p A.M.'s between 5 and 41 and third

mean : (p-1)th mean = 2 : 5, find p.

**86.** The product of two numbers is 16. The product of two A.M.'s between them is 24. Find the numbers.





specified term

1 + 3 + 5 + 7..... upto 30th term.

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89. Find the sum of the following AP up to the

specified term

2 + 6 + 10 + .....upto 50th term.

specified term

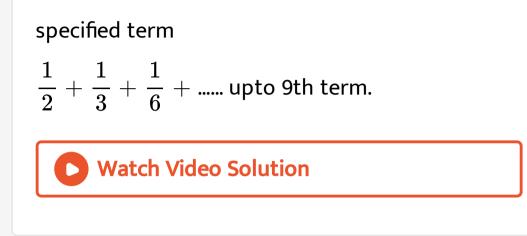
20+ 18+ 16..... Upto 12th term.

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91. Find the sum of the following AP is up to the

specified term

4+7+10..... Upto 112th term.



93. Find the sum of the following series up to the

specified term

$$\sqrt{2}+\sqrt{2}ig(1-\sqrt{2}ig)+\sqrt{2}ig(1-2\sqrt{2}ig)$$
....upto 21 th

term



specified term

-8-3+2+.....upto 20th term.



### 95. Find the sum of the following series up to the

specified term

$$rac{x^2-1}{x}+x+rac{x^2+1}{x}+$$
 .....upto nth term.

#### specified term

(x-y)+(2x-3y)+(3x-5y)+..... upto nth

term.

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97. Find the sum of the following series up to the

specified term

$$rac{n}{n}+rac{n-1}{n}+rac{n-2}{n}+$$
 .....upto nth term.

specified term

1 + 4 + 7 + ..... + 37

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99. Find the sum of the following series up to the

specified term

2+5+8+.....+152

the specified term

1-3-7-.....-47

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**101.** By inserting eight A.M.'s between 2 and 29 prove that the sum of the eight A.M's is equal to eight times of A.M. of 2 and 29.

102. Show that the sum of 500 A.M.'s between 2

and 3 is 1250.



**103.** Prove that the ratio of the sum of m A.M.'s

between any two numbers to the sum of n A.M's

between the same numbers is equal to  $\frac{m}{n}$ .



104. The sum of fIrst n terms of an A.P series is

 $26n - 2n^2$ . Find the fifth term.

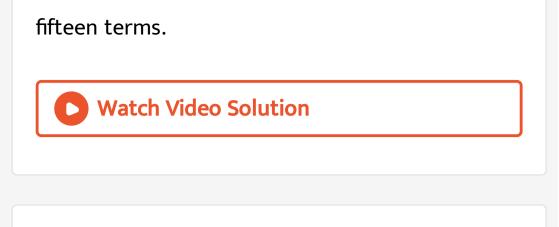
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**105.** Find the rth term of an A.P., the sum of whose first n terms is  $2n + 3n^2$ .

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106. The first term and common difference of an

A.P. are 3 and 2 respectively. Find the sum of first



**107.** The fifth and ninth terms of an A.P. are respectively -15 and -13. Find the sum of first ten

terms.

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**108.** The first term and common difference of an A.P. are respectively 4 and 2. If the sum up to n terms is 88, find n.



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**109.** The first term and common difference of an

A.P. are respectively -2 and -4. If the sum upto n

terms is -288, find n.

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**110.** The first term and last term of an A.P. are respectively 1 and 157. If the sum is 3160 find the number of terms.



**111.** The first term and last term of an A.P. are 5 and 123 respectively. If the sum of the series is 3840, determine the number of terms and common difference.

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112. If the sum upto 21st term of an A.P. is 630,

determine the 11th term.

113. If 18th term of an A.P. is 52, determine the

sum upto 35th term.



**114.** In an A.P. if the ratio of the sum upto 10th term and the 10th term is 140 : 23, and the common difference is 2, then determine the first term.

115. The seventh term of an A.P. is 20 and the sum

of first twenty terms is 610. Find the tenth term

and the sum of first fifteen terms.



**116.** The sum of first ten terms of an A.P. is 120. The sum of next ten terms is 320. Find the first term and common difference.

117. In an A.P. the ratio of 7th term to 11th term is

19:31 and the sum of these two terms is 20.Find

the sum of first twenty terms.



**118.** The sum of first nine terms of an A.P. is 171 and that of 24 terms is 996. Find the sum of first 16 terms.

**119.** In an A.P. the nth term is p and the sum of first n terms is q. Show that the first term of the series is  $\frac{2q - pn}{n}$ .

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120. If  $\{S_1, S_2, S_3\}$  denoted the sum of n terms of three series in A.P. the first term of each being the same and the respective common difference 1, 2 and 3, show that  $\{S_1 + S_3 = 2S_2\}$ .



**121.** The sum of first n terms of an A.P. is m and that of first m terms is n. Prove that the sum of first m + n terms is -(m + n).

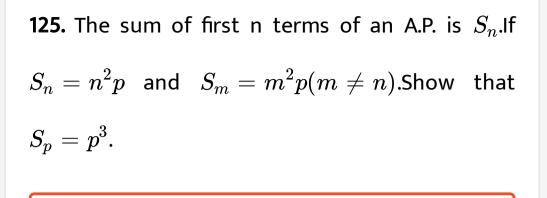


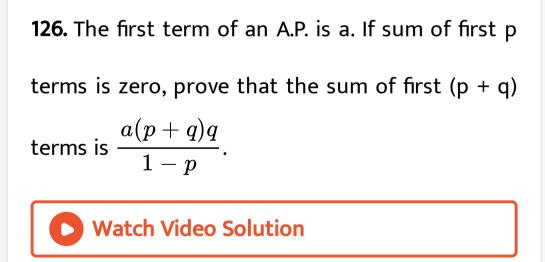
**122.** The ratio of sum of the first n terms of two series in A.P is (3n + 8): (7n + 15). Prove that

the ratio of their 12th terms is 7 : 16.

**123.** In an A.P. the pth and qth terms are respectively a and b. Show that the sum of first p + q terms is  $\frac{p+q}{2}\left\{(a+b) + \frac{a-b}{p-q}\right\}$ . **Vatch Video Solution** 

**124.** If the first terms, second term and the last term of an A.P. are respectively a,b and c.Prove that the sum of the series is  $\frac{(a+c)(b+c-2a)}{2(b-a)}.$ 





**127.** The sum of first P terms of an A.P. is equal to that of the first Q terms. Prove that the sum of first (P+Q) terms is zero.



**128.** Find the sum of all odd numbers lying between 12 and 90.



129. Determine the sum of the numbers lying

between 100 and 500 which are divisible by 11.



130. Find the sum of all numbers lying between 1

and 100 which are divisible by 4 or 5.

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**131.** Determine the sum of the numbers lying between 100 and 200 which are not divisible by 3.



# 132. Determine the sum of following series upto n

terms.

 $1.2+2.3+3.4+\ldots$ 

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133. Determine the sum of following series upto n

terms.

 $1.1 + 2.3 + 3.5 + \dots$ 



134. Determine the sum of following series upto

n terms.

 $2.1 + 3.3 + 4.5 + \dots$ 

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135. Determine the sum of following series upto n

terms.

 $3.8 + 6.11 + 9.14 + \dots$ 

136. Determine the sum of following series upto n

terms.

 $1.3+2.4+3.5+\ldots$ 



### 137. Determine the sum of following series upto n

terms.

 $1.3 + 5.7 + 9.11 + \dots$ 

138. Determine the sum of following series upto n

terms.

$$\left(3^2-2^2
ight)+\left(5^2-4^2
ight)+\left(7^2-6^2
ight)+....$$



### 139. Determine the sum of following series upto n

terms.

$$ig(1^2-2^2ig)+ig(3^2-4^2ig)+ig(5^2-6^2ig)+....$$

140. Determine the sum of following series upto

n terms.

 $1.2^2 + 2.3^2 + 3.4^2 + \ldots \ldots$ 



#### 141. Determine the sum of following series upto n

terms.

 $1 + (1 + 2) + (1 + 2 + 3) + \dots$ 

142. Determine the sum of following series upto

n terms.

 $1 + (3 + 5) + (7 + 9 + 11) + \dots$ 

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**143.** The following are the nth terms of certain sequences. Determine whether they are G.P. or not. If it is so find the first term and common ratio.

 $3^{n+2}$ .

**144.** The following are the nth terms of certain sequences. Determine whether they are G.P. or not. If it is so find the first term and common ratio.

 $3^n + 2$ .



**145.** The following are the nth terms of certain sequences. Determine whether they are G.P. or not. If it is so find the first term and common

ratio.

 $2^{8-n}$ .



**146.** The following are the nth terms of certain sequences. Determine whether they are G.P. or not. If it is so find the first term and common ratio.

 $2^{n-1}$ .

**147.** The following are the nth terms of certain sequences. Determine whether they are G.P. or not. If it is so find the first term and common ratio.

 $(-2)^{n-3}$ .

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**148.** The following are the nth terms of certain sequences. Determine whether they are G.P. or not. If it is so find the first term and common

ratio.

 $3^{\frac{n}{2}}$ .



**149.** The following are the nth terms of certain sequences. Determine whether they are G.P. or not. If it is so find the first term and common ratio.

 $3.2^{n-1}$ .

**150.** The following are the nth terms of certain sequences. Determine whether they are G.P. or not. If it is so find the first term and common ratio.

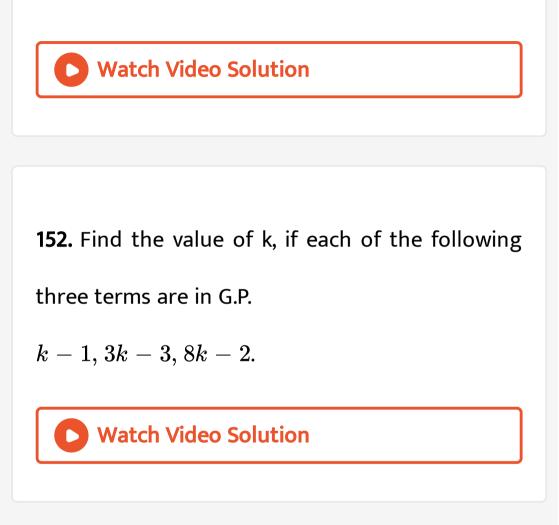
 $ak^{2n-1}$ .

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**151.** The following are the nth terms of certain sequences. Determine whether they are G.P. or not. If it is so find the first term and common

ratio.

$$n^2 + n + 1.$$



153. Find the value of k, if each of the following

three terms are in G.P.

3k + 1, 6k - 4, 3k - 2.Watch Video Solution

**154.** Find the value of k, if each of the following three terms are in G.P.

3k, 3k + 3, 3k + 8.



155. Find the value of k, if each of the following

three terms are in G.P.

k + 1, 2k + 2, 5k - 2.



156. Find the value of k, if each of the following

three terms are in G.P.

3k - 7, 5k - 1, 14k + 2.

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**157.** Find the terms of the following G.P. as specified.

5th and 8th terms of 1,3,9,27,...



**158.** Find the terms of the following G.P. as specified.

6th and 10th terms of  $\sqrt{3}, \frac{1}{\sqrt{3}}, \frac{1}{3\sqrt{3}}, \dots$ 

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**159.** Find the terms of the following G.P. as specified.

4th and 9th terms of 
$$1, \ -rac{1}{2}, rac{1}{4}$$
,....

**160.** Find the terms of the following G.P. as specified.

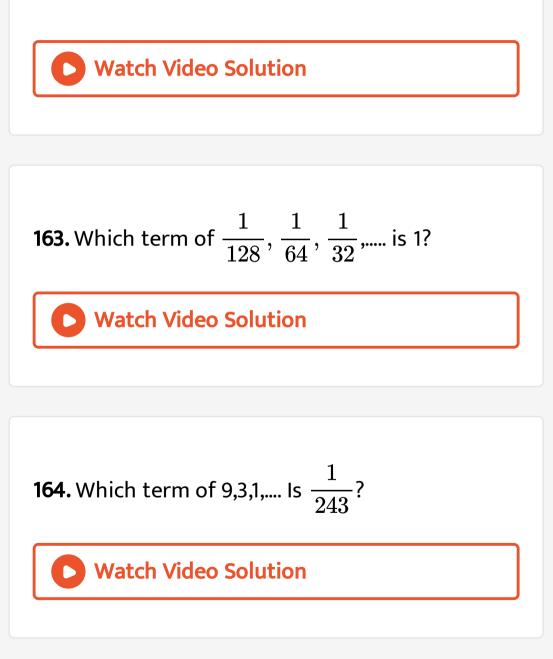
Eighth terms of  $ig(\sqrt{2}+1ig), 1, ig(\sqrt{2}-1ig)$ ,.....

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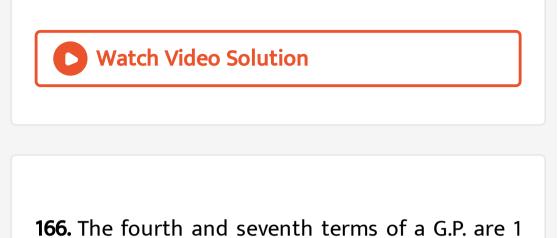
**161.** Find the terms of the following G.P. as specified.

Fifth term of  $p^2, pq, q^2,$ ....

162. Which term of 2, 4, 8, 16,.... is 2048?



**165.** Which term of 4,-8,16,-32,..... is 1024?



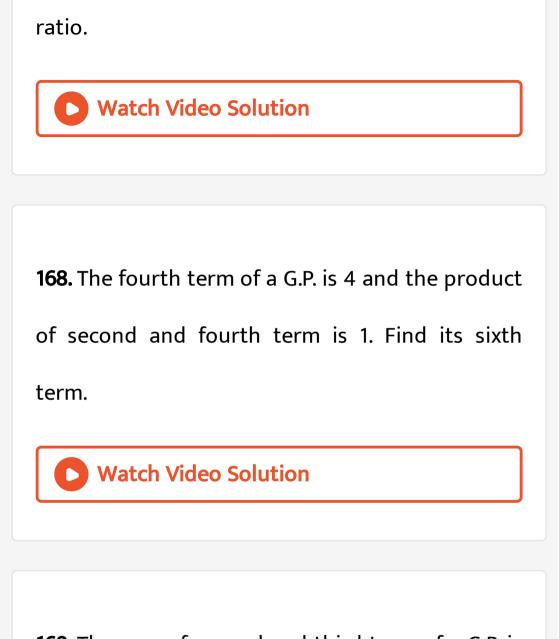
and  $rac{1}{8}$  respectively. Determine the G.P. Also find

its nineth term.

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**167.** The second and fifth term of a G.P. are 24 and

81 respectively. Find the first term and common



**169.** The sum of second and third term of a G.P. is 1 16

 $-\frac{1}{9}$  and that of sixth and seventh term is  $-\frac{10}{729}$ 

.Find its first term and common ratio.



**170.** The fifth term of a G.P. is four times the third term. The sum of the first and second term is

-4.Determine the G.P.

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**171.** The sum of the second and third term of a G.P. is 3 and that of fourth and fifth term is 12. Determine the first term.



**172.** The third term of a G.P. is square of the first term. The fifth term is 64. Determine the first term and common ratio.

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**173.** The first term and common ratio of a G.P. are both positive. The product of first and second term is 9 and that of first and fourth term is 144. Find the third term.



**174.** The first, fourth and thirteenth term of an A.P. are in G.P. If the first term of the A.P. is 3, find the A.P.

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**175.** In a G.P., the (p + q)th term is m and (p-q)th

term is n. Find its pth term.

176. The sum of three numbers in G.P. is 52 and

their product is 1728.Find the numbers.



**177.** The sum of three positive numbers in G.P. is 21. The sum of second and third term is twenty times the first term. Find the numbers.



**178.** The sum of three numbers in G.P. is 26. If the product of first and third is six times the second term, Find the numbers.



179. The sum of three numbers in G.P. is 7. If sum

of their squares is 21, Find the numbers.



**180.** The sum of three numbers in A.P. is 18. If 2, 4 and 11 are added to them respectively, the results are in G.P., find them.



**181.** The sum of three numbers in A.P. is 15. If 1, 4 and 19 are added to them respectively, the results are in G.P., find them.

**182.** The product of three numbers in G.P. is 512. If 8 be added to the first, and 6 to the second, then these two sums and the third term form an A.P.,

find the numbers.



**183.** The sum of three numbers in G.P. is 70. If the first and last term are multiplied by 4 and the middle term by 5, then they will be in A.P., find them.



**184.** Divide 42 in three parts which are in G.P. such that the square of the middle term is twice the greatest.



185. If 1, 1, 3 and 9 be added respectively to four

members in A.P. then a G.P. results. Find the

numbers if their sum is 16.



186. x and y are two positive integers such that 2,x, y are in A.P. and x, y, 9 are in G.P. then show that -x = 4, y = 6.

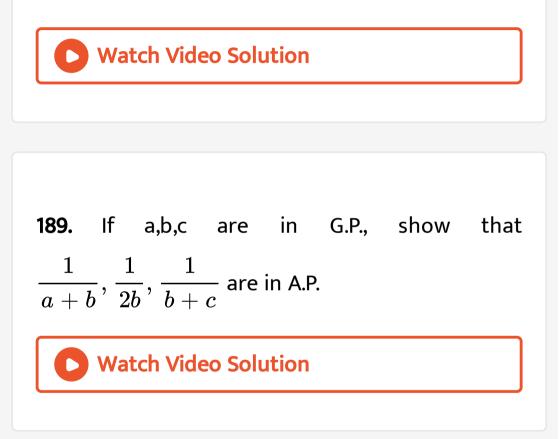


**187.** The numbers  $x, 8, y(x \neq y)$  are in G.P. and the numbers x, y, -8 are in A.P., then show that

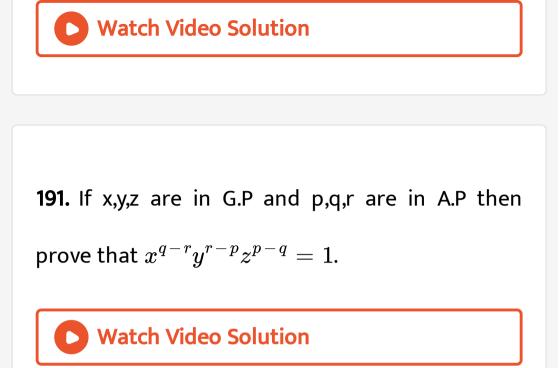
x = 16, y = 4

188. If a, b, c are in A.P. and a,b, d are in G.P., prove

that a, a-b, d-c are in G.P.



**190.** If a, b, c are in A.P. and a, b, c + 1 are in G.P. then prove that  $4a = (a - c)^2$ .



192. If a,b,c are in G.P and  $a^{rac{1}{x}}=b^{rac{1}{y}}=c^{rac{1}{z}}$  then

prove that x,y,z are in A.P.

193. If x, y, z,w in are in G.P., prove that  $\frac{xy-wz}{y^2-z^2}=rac{x+z}{y}.$ 

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194. The pth, qth and rth term of a G.P. are x, y, z respectively, then prove that- $x^{q-r}$ .  $y^{r-p}$ .  $z^{p-q} = 1$ .



195. If pth, qth and rth term of a G.P. are in G.P.

then prove that p, q, r are in A.P.



```
196. If pth, qth and rth term of an A.P. are in G.P.,
then show that common ratio of the G.P. is
\frac{q-r}{p-q}.
```



**197.** If a, b, c be the pth, qth and rth term of both an A.P. and G.P., then show that  $a^{b-c}$ .  $b^{c-a}$ .  $c^{a-b} = 1$ .



198. If a, b, c, d are in G.P., show that each of the

following three term are also in G.P.

$$a+b, b+c, c+d.$$

**199.** If a,b,c,d are in G.P show that each of the following three term are also in G.P $a^2 + b^2, b^2 + c^2, c^2 + d^2.$ 

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**200.** If a,b,c,d are in G.P show that each of the following three term are also in G.P $a^2 - b^2, b^2 - c^2, c^2 - d^2.$ 

**201.** If a,b,c,d are in G.P show that each of the following three term are also in G.P  $(a - b)^2$ ,  $(b - c)^2$ ,  $(c - d)^2$ .

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202. If a, b, c, d are in G.P., show that each of the

following three term are also in G.P.

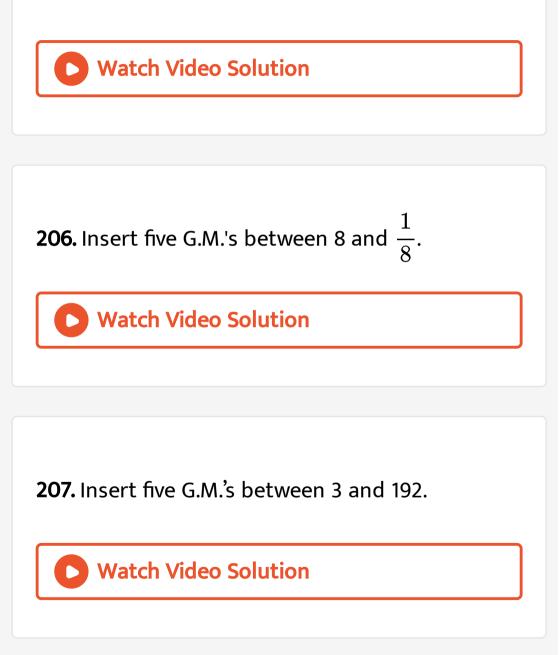
$$a^3 + b^3, b^3 + c^3, c^3 + d^3.$$

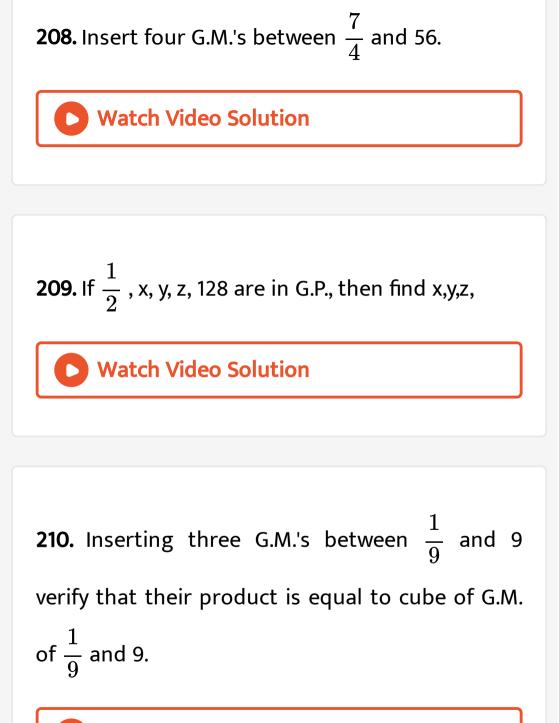
**203.** If a,b,c,d are in G.P show that each of the following three term are also in G.P  $(a - b)^2$ ,  $(b - c)^2$ ,  $(c - d)^2$ .

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204. If a,b,c,d are in G.P show that each of the following three term are also in G.P $a^2 + b^2 + c^2$ , ab + bc + cd,  $b^2 + c^2 + d^2$ .

**205.** Insert three G.M.'s between 1 and 256.





211. The A.M. and G.M. of two positive numbers

are 25 and 24 respectively. Find them.

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212. The A.M. and G.M. of two positive numbers

are 15 and 9 respectively. Find them.



213. The A.M. of two integral numbers exceedstheir G.M. by 2 and the ratio of the numbers is 1 :4. Find them.



214. The sum of two positive numbers is 13 and

their G.M. is 6. Find them.



**215.** The difference of two positive numbers is 64 and the difference of their A.M. and G.M. is 16. Find the numbers.



**216.** The sum of A.M. and G.M. of two positive numbers is 32 and the ratio of these two numbers is 1:9. Find them.

**217.** The sum of A.M. and G.M. of two positive numbers is 96 and the ratio of the two numbers is 1:9. Find them.



**218.** The A.M. of two positive numbers is 26. If the sum of the two numbers exceeds the sum of their A.M. and G.M. by 2, find the numbers.

**219.** The ratio of A.M. and G.M. of two positive numbers is 5:4. If the difference between them is 12, find the numbers

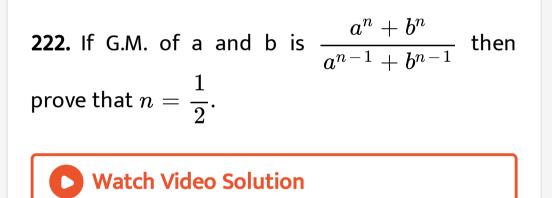


**220.** The difference between the arithmetic mean and geometric mean of two positive numbers is 16. If the ratio of the numbers is 1:25 find the numbers



221. If G.M. of a and b is  $\frac{a^{n+1}+b^{n+1}}{a^n+b^n}$ , then prove that  $n=-\frac{1}{2}$ .

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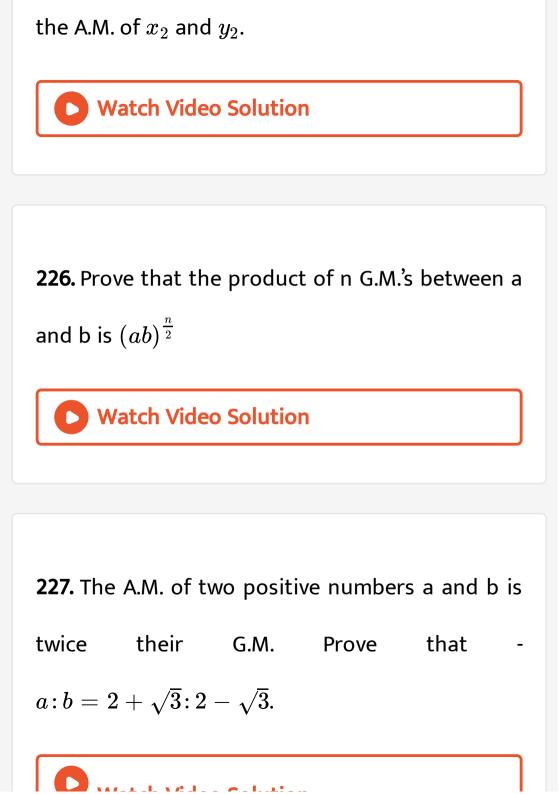
**223.** If 'g' be the GM and p and q be the two A.M.'s between two given numbers, then show that

 $g^2 = (2p - q)(2q - p).$ 



**224.** If A be the A.M. of two given numbers and  $g_1$ and  $g_2$  be two G.M.'s between them,then show that-  $2A = \frac{g_1^2}{g_2} + \frac{g_2^2}{g_1}$ . Watch Video Solution

**225.** a, b, c are in A.P. If x be the G.M. of a and b, and y be the G.M. of b and c, then prove that  $b^2$  is





**228.** If A and G be the A.M. and G.M. of two numbers a and b and A:G=m:n,then prove that- $a:b=m+\sqrt{m^2-n^2}:m-\sqrt{m^2-n^2}$ 

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229. Find the sum of the following series

1 + 2 + 4..... to tenth term.



230. Find the sum of the following series

1 + 3 + 9...... to tenth term



231. Find the sum of the following series

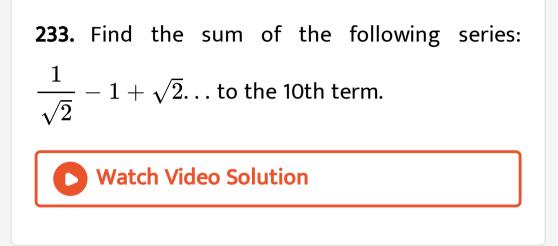
128 + 64 + 32... to tenth term.

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232. Find the sum of the following series:  $1-3+9-27+\ldots$  to the 9th term.







### 234. Find the sum of the following series

$$1+rac{1}{3}+rac{1}{3^2}$$
....to tenth term.

**235.** Find the sum of the following series:  
$$2 + 1 + \frac{1}{2} + \frac{1}{2^2} \dots$$
 to the nth term.  
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**236.** Find the sum of the following series

 $rac{x+y}{x-y}+1+rac{x-y}{x+y}+....$  to n th term.

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237. Find the sum of the following series

 $(a-x)+\left(a^2-x^2
ight)+\left(a^3-x^3
ight)+$ ..... To n th

term.
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<b>238.</b> Find the number of terms if-
1 + 2 + 4 +=32767
Watch Video Solution
Watch video solution
<b>239.</b> Find the number of terms if-
$64 + 32 + 16 +$ = $127 \bigg( rac{1}{2} \bigg).$

240. Find the number of terms if-

3-6+12-24+ ....=-1023.

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**241.** Find the sum of first n terms of the following

 $1 + 11 + 111 + 1111 + \ldots$ 



242. Find the sum of first n terms of the following

 $5+55+555+\ldots$ 



243. Find the sum of first n terms of the following

 $3+33+333+\ldots$ 

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244. Find the sum of first n terms of the following

 $.7 + .77 + .777 + \ldots$ 



# 245. Find the sum of first n term of the following

series

4 + 0.4 + 0.44 + ....

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## 246. Find the sum of first n term of the following

series

$$1+(1+2)+\left(1+2+2^2
ight)+....$$

**247.** Find the sum of first n term of the following series

 $1 + (1 + 3) + (1 + 3 + 3^2) + ....$ 

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**248.** If  $S_1$ ,  $S_2$  and  $S_3$  be the sums of first n term ,of 2 n terms and of 3n terms of a G.P. respectively,then prove that-

$$S_1^2 + S_2^2 = S_1(S_2 + S_3).$$

**249.** If  $S_1$ ,  $S_2$  and  $S_3$  be the sums of first n term ,of 2 n terms and of 3n terms of a G.P. respectively,then prove that-

 $S_1(S_3-S_2)=\left(S_2-S_1
ight)^2.$