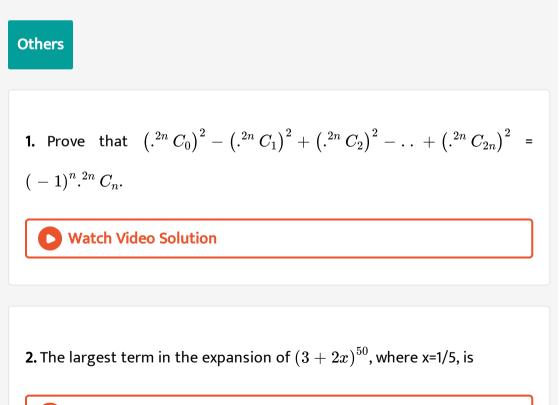




MATHS

BOOKS - CENGAGE PUBLICATION

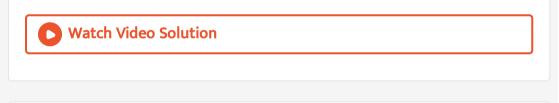
BINOMIAL THEOREM



3.
$$\frac{1}{n!} + \frac{1}{2!(n-2)!} + \frac{1}{4!(n-4)!} + \dots$$
 is equal to

4. Find the sum of the last 30 coefficients in the expansion of $\left(1+x
ight)^{59},$

when expanded in ascending powers of x.

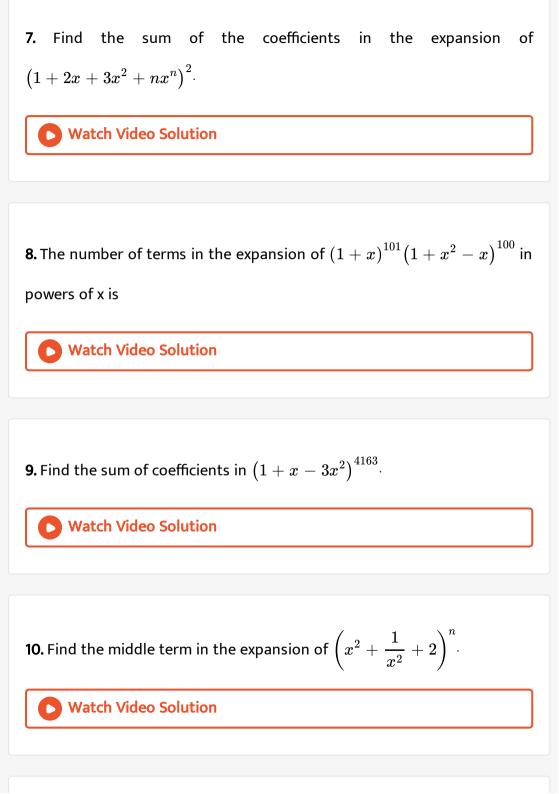


5. If x = 1/3, find the greatest tem in the expansion of $(1 + 4x)^8$.

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6. If the sum of coefficients in the expansion of $(x - 2y + 3z)^n$ is 128, then find the greatest coefficient in the expansion of $(1 + x)^n$.





11. In the expansion of $\left(1+x
ight)^{50},\,\,$ find the sum of coefficients of odd

powers of x.



12. If
$$\left(1+x-2x^2
ight)^6 = 1+a_1x+a_2x^2+\ldots +a_{12}x^{12}$$
 then

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13. If the middle term in the binomial expansion of $\left(\frac{1}{x} + x \sin x\right)^{10}$ is equal to $\frac{63}{8}$, find the value of x.

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14. Find the sum $C_0+3C_1+3^2C_2+...+3^nC_n$.

15. If
$$(1+x)^n = \sum_{r=0}^n C_r x^r$$
, then prove that $C_1 + 2C_2 + 3C_3 + \dots + nC_n = n2^{n-1}$.
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16. If T_0, T_1, T_2, T_n represent the terms in the expansion of $(x + a)^n$,

then find the value of $\left(T_0-T_2+T_4ight)^2+(T_1-T_3+T_5-)^2n\in N_2$

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17. If
$$ig(1+x+x^2ig)^n=a_0+a_1x+a_2x^2+{}+a_{2n}x^{2n},$$
 find the value of $a_0+a_3+a_6+{}+,n\in N$.

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18. Find the sum $C_0-C_2+C_4-C_6+\ldots$,where $C_r=^n C_r$.

19. Prove that
$$.^n C_0 + ^n C_3 + ^n C_6 + = rac{1}{3} \Big(2^n + 2 \cos \Big(rac{n \pi}{3} \Big) \Big) \, .$$

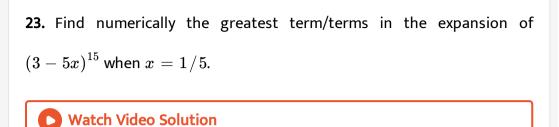
20. Given that the 4^{th} term in the expansion of $\left(2+\frac{3}{8}x\right)^{10}$ has the maximum numerical value. Find the range of the value of x for which this

will be true.

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21. Find the greatest coefficient in the expansion of $\left(1+2x\,/\,3
ight)^{15}$.

22. Find the greatest term in the expansion of
$$\sqrt{3}\left(1+\frac{1}{\sqrt{3}}\right)^{20}$$
.



24. Let n be an odd natural number greater than 1. Then , find the number

of zeros at the end of the sum $99^n + 1$.

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25. Find the remainder when 27^{40} is divided by 12.



26. In the expansion of $(1 + x)^n$, 7th and 8th terms are equal. Find the value of $(7/x+6)^2$.



27. Find the sum
$$\sum_{j=0}^n \left(\ \hat{} \ (4n+1)C_j + ^{4n+1}C_{2n-j}
ight).$$

28. Show that no three consecutive binomial coefficients can be in G.P.

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29. Find the sum
$$\sum_{r=1}^{n} r^n \frac{\hat{n}C_r}{\hat{n}C_{r-1}}$$

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30. Show that $9^{n+1} - 8n - 9$ is divisible by 64, where n is a positive

integer.

31. If the 3rd, 4th. 5th and sixth term in the expansion of $(x + \alpha)^n$ are a,b,c,d respectively, then prove that $\left(\frac{b^2 - ac}{c^2 - bd}\right) = \frac{5a}{3c}$. Watch Video Solution

32. Find the remainder when 7^{98} is divided by 5.

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33. Show that $2^{4n+4} - 15n - 16$, $where \ {\sf n} \ \in N$ is divisible by 225.

34. If $\left(2+\sqrt{3}
ight)^n = I+f,\,\,$ where $\,I\,\,$ and $\,n\,\,$ are positive integers and $0 < f < 1,\,$

show that I is an odd integer and (1-f)(1+f)=1

35. Find the degree of the polynomial
$$\frac{1}{\sqrt{4x+1}} \left\{ \left(\frac{1+\sqrt{4x+1}}{2}\right)^7 - \left(\frac{1+\sqrt{4x+1}}{2}\right)^7 \right\}$$

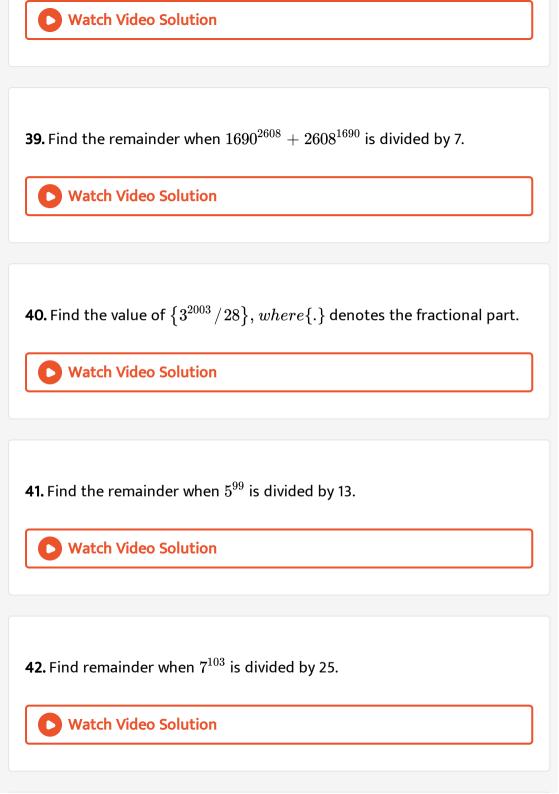
36. If 9^7+7^9 is divisible b $2^n,$ then find the greatest value of $n, wheren \in N$.

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37. Prove that $\sqrt{10}\Big[ig(\sqrt{10}+1ig)^{100}-ig(\sqrt{10}-1ig)^{100}\Big]$ is an even integer .

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38. Find the remainder when $x = 5^{5^{5^{5^{-...}}}}$ (24 times 5) is divided by 24.



43. Using binomial theorem prove that $6^n - 5n$ always leaves remainder I

when divided by 25.



44. If the coefficient of the middle term in the expansion of $(1 + x)^{2n+2}$ is α and the coefficients of middle terms in the expansion of $(1 + x)^{2n+1}$ are β and γ then relate α , β and γ .

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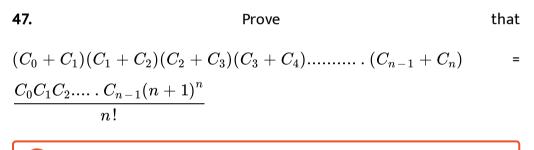
45. If the coefficients of three consecutive terms in the expansion of

 $(1+x)^n$ are in the ratio 1:7:42, then find the value of n_{\cdot}



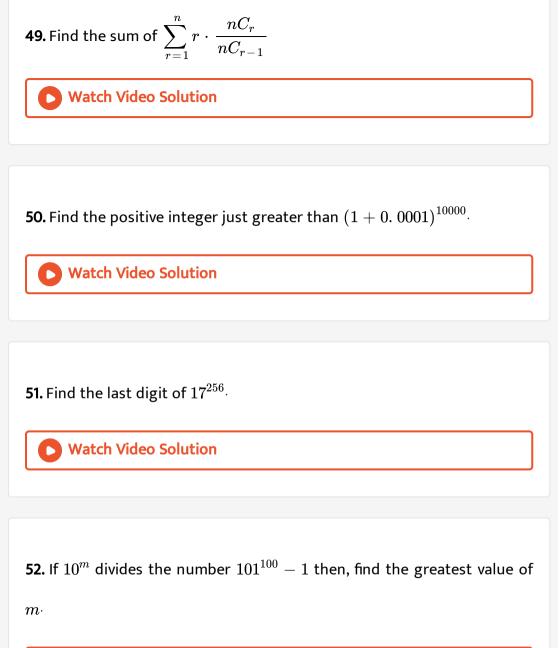
46. In the coefficients of rth, (r+1)th, and(r+2)th terms in the binomial expansion of $(1+y)^m$ are in A.P., then prove that $m^2 - m(4r+1) + 4r^2 - 2 = 0.$





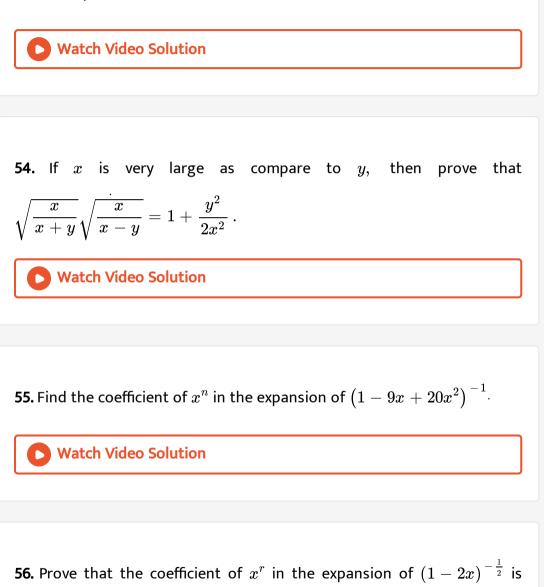
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48. If the coefficients of four consecutive terms in the expansion of $(1 + x)^n$ are a_1, a_2, a_3 and a_4 respectively. then prove that `a_1/(a_1+a_2)+a_3/(a_3+a_4)=2a_2/(a_2+a_3).



53. Using the principle of mathematical induction, prove that $\left(2^{3n}-1
ight)$ is

divisible by 7 for all $n \in N$



 $\frac{2r\,!}{\left(2^r\right)(r\,!)^2}$

57. Find the sum:
$$1 - \frac{1}{8} + \frac{1}{8} imes \frac{3}{16} - \frac{1 imes 3 imes 5}{8 imes 16 imes 24} + ...$$

58. Show that
$$\sqrt{3} = 1 + \frac{1}{3} + (\frac{1}{3}) \cdot (\frac{3}{6}) + (\frac{1}{3}) \cdot (\frac{3}{6}) \cdot (\frac{5}{9}) + \dots$$

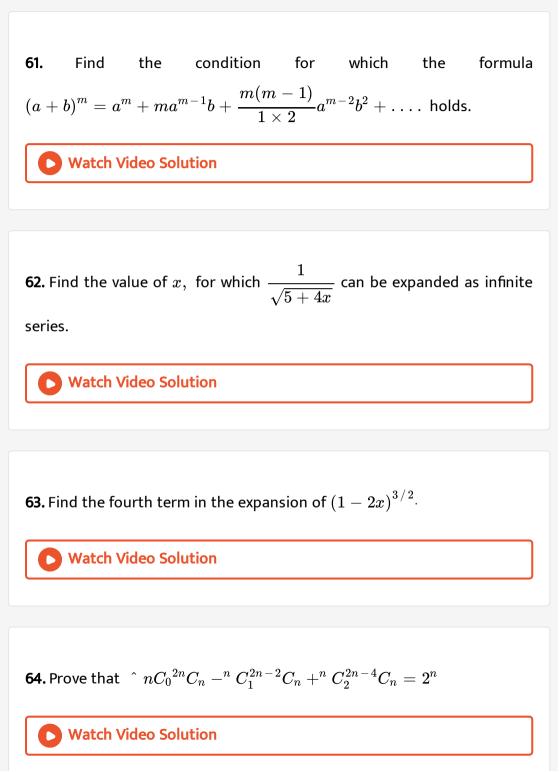
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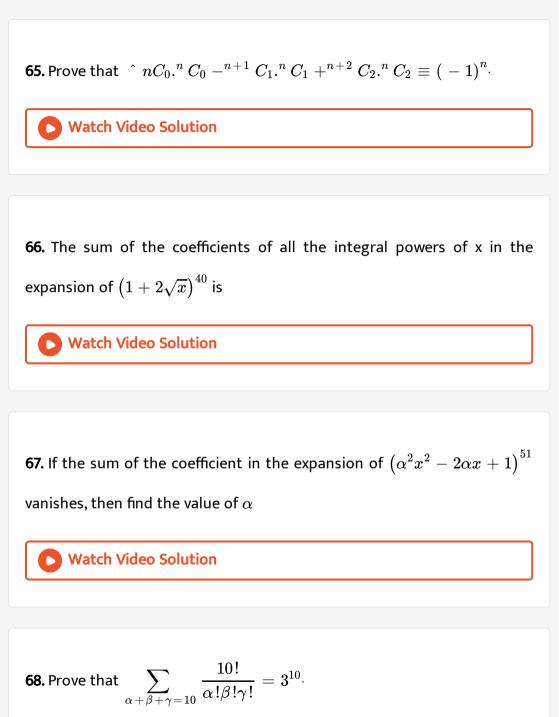
59. Assuming x to be so small that x^2 and higher power of x can be

neglected, prove that
$$rac{\left(1+rac{3x}{4}
ight)^{-4}(16-3x)^{rac{1}{2}}}{\left(8+x
ight)^{rac{2}{3}}}=1-\left(rac{305}{96}
ight)x$$

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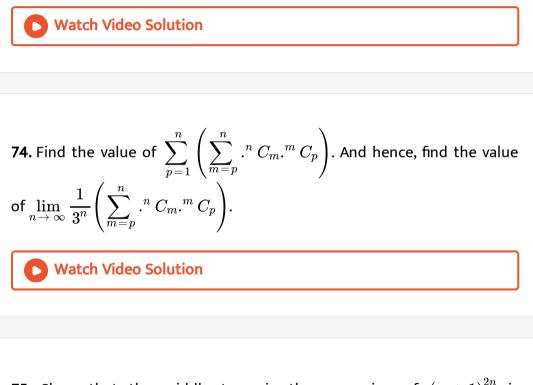
60. Find the sum `sumsum_(Olt=i





73. If the sum of coefficient of first half terms in the expansion of

 $\left(x+y
ight)^n$ is 256 , then find the greatest coefficient in the expansion.



75. Show that the middle term in the expansion of $(x+1)^{2n}$ is $\frac{1.3.5....(2n-1)}{n!}2^n \cdot x^n$.

76. If the middle term in the expansion of $\left(x^2+1/x
ight)^n$ is $924~x^6$, then

find the value of n.



77. The first three terms in the expansion of $(1+ax)^n (n
eq 0)$ are

1, $6x \text{ and } 16x^2$. Then find the value of a and n.

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78. If x^4 occurs in the rth term in the expansion of $\left(x^4+rac{1}{x^3}
ight)^{15}$, then

find the value of r.



79. Find the coefficient of x^{-10} in the expansion of $\left(\frac{a}{x} + bx\right)^{12}$.

80. Find the constant term in the expansion of $\left(x - \frac{1}{x}\right)^6$.



81. If the coefficients of (r-5)th and (2r-1)th terms in the expansion

of $\left(1+x
ight)^{34}$ are equal, find r_{\cdot}

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82. In
$$\left(2^{\frac{1}{3}}+\frac{1}{3^{\frac{1}{3}}}\right)^n$$
 if the ratio of 7th term from the beginning to the

7th term from the end is 1/6, then find the value of n.

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83. If the coefficient of 4th term in the expansion of $(a + b)^n$ is 56, then n

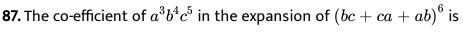
84. If p and q are positive, then prove that the coefficients of x^p and x^q in the expansion of $(1 + x)^{p+q}$ will be equal.

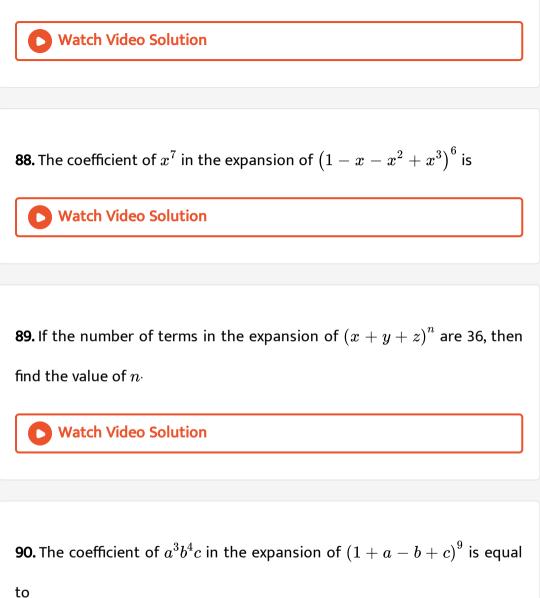
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85. Find the number of irrational terms in the expansion of $\left(5^{1/6}+2^{1/8}
ight)^{100}$.

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86. If x^p occurs in the expansion of $\left(x^2 + \frac{1}{x}\right)^{2n}$, prove that its coefficient is $\frac{(2n)!}{\left[\frac{1}{3}(4n-p)\right]!\left[\frac{1}{3}(2n+p)\right]!}$.





91. The coefficient of x^4 in the expansion of $\left(1+x+x^2+x^3
ight)^{11}$ is



92. Find the number of terms which are free from radical signs in the

expansion of
$$\left(y^{1/5}+x^{1/10}
ight)^{55}$$
 .

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93. Find the coefficient of x^5 in the expression of $(1 + x^2)^5 (1 + x)^4$.

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94. Find the coefficient of x^{13} in the expansion of $(1-x)^5 imes ig(1+x+x^2+x^3ig)^4ig\cdot$

95. Find the sum .¹⁰ C_1 +¹⁰ C_3 +¹⁰ C_5 +¹⁰ C_7 +¹⁰ C_9



96. Find the sum of
$$\frac{1}{1!(n-1)!} + \frac{1}{3!(n-3)!} + \frac{1}{5!(n-5)!} + ...,$$

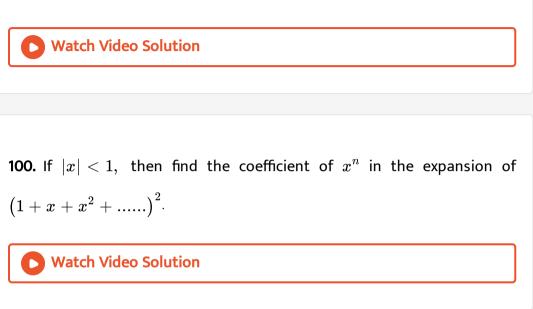
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97. If n is an even positive integer, then find the value of x if the greatest term in the expansion of $(1 + x)^n$ may have the greatest coefficient also.

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98. If |x|<1, then find the coefficient of x^n in the expansion of $\left(1+2x+3x^2+4x^3+
ight)^{1/2}.$

99. If (r+1)th term is the first negative term in the expansion of $(1+x)^{7/2}$, then find the value of r.



```
101. If |x|>1, 	ext{ then expand } (1+x)^{-2}.
```

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102. Find the cube root of 27

103. Find the coefficient of
$$x^2$$
 in $\left(rac{a}{a+x}
ight)^{1/2}+\left(rac{a}{a-x}
ight)^{1/2}$

104.

Prove

that

 $:^{10}C_1{(x-1)}^2-^{10}C_2{(x-2)}^2+^{10}C_3{(x-3)}^2.....-^{10}C_{10}{(x-10)}^2=x^2$

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105. If the third term in the expansion of $(1 + x)^m is - \frac{1}{8}x^2$, then find the value of m.

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106. Prove that
$$\sum_{r=0}^n r(n-r) (.^n C_r)^2 = n^2 (.^{2n-2} C_n) \cdot$$

107. Prove that

$$1 - {}^{n}C_{1}\frac{1+x}{1+nx} + {}^{n}C_{2}\frac{1+2x}{(1+nx)^{2}} - {}^{n}C_{3}\frac{1+3x}{(1+nx)^{3}} + \dots (n+1)terms =$$

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108. Find the coefficient of x^{20} in $\left(x^{2}+2+\frac{1}{x^{2}}\right)^{-5}(1+x^{2})^{40}$.
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109. The number of terms in the expansion of $(a + b + c)^{n}$ where $n \in N$ is
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110. Find the coefficient of x^{50} in the expansion of $\left(1+x
ight)^{101} imes\left(1-x+x^2
ight)^{100}$

 111. Find the coefficient of x^4 in the expansion of $(2 - x + 3x^2)^6$.

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 112.
 Find
 the
 coefficient
 of

 $x^k \in 1 + (1 + x) + (1 + x)^2 + + (1 + x)^n (0 \le k \le n)$.

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113. The term independent of x in the expansion of $(1 + x + 2x^3)\left(\frac{3}{2}(x^2) - \frac{1}{3x}\right)^9$

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114. If aandb are distinct integers, prove that a-b is a factor of a^n-b^n ,

wherever n is a positive integer.



115. Find a, b and n in the expansion of $(a + b)^n$ if the first three term s of

the expansion are 729, 7290 and 30375, respectively.



116. Find the coefficient of
$$x^{20}$$
 in expansion of expression

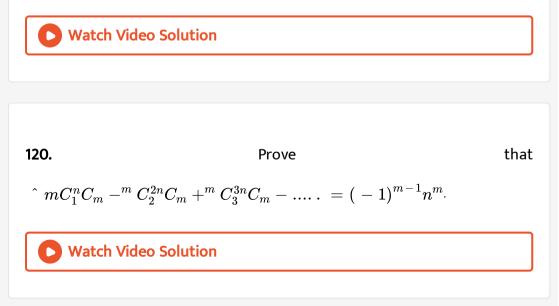
$$\sum_{r=0}^{50} \hat{} (50)C_r(2x-3)^r(2-x)^{50-r}.$$
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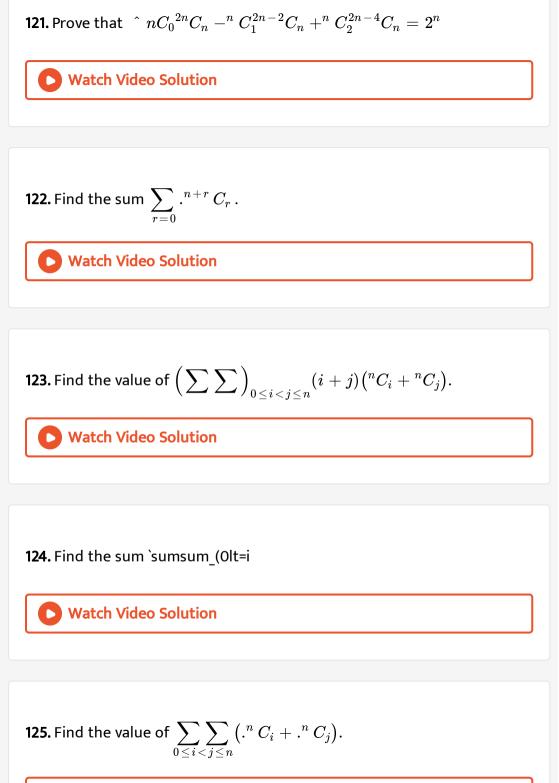
117. If the sum of the coefficients of the first, second, and third terms of the expansion of $\left(x^2 + \frac{1}{x}\right)^m$ is 46, then find the coefficient of the term that does not contain x.

118. If p+q=1, then show that $\sum_{r=0}^n r^2 \, \hat{\,\,}\, n C_r p^r q^{n-r} = npq + n^2 p^2$

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119. If every pair from among the equations $x^2 + ax + bc = 0$. $x^2 + bx + ca = 0$, andx62 + cx + ab = 0 has a common root, then the sum of the three common roots is -1/2(a + b + c) the sum of the three common roots is 2(a + b + c) the product of the three common roots is abc the product of the three common roots is $a^2b^2c^2$





126. Find the sum
$$\left(\sum\sum
ight)_{0\leq i< j\leq n}{}^nC_i.{}^nC_j.$$

127. Prove that
$$\sum\limits_{r=0}^s \sum\limits_{s=1}^n \ \hat{}\ nC_s^sC_r = 3^n-1.$$

128. Find the sum
$$\sum \sum_{0 \leq i < j \leq n} {}^n C_i$$

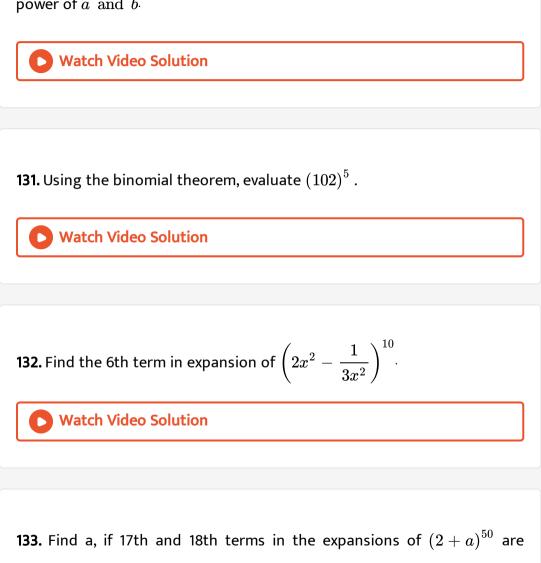
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129. Find the coefficient of x^4 in the expansion of $\left(rac{x}{2}-rac{3}{x^2}
ight)^{10}$.

I30. Find the term in
$$\left(3\sqrt{\left(\frac{a}{\sqrt{b}}\right)} + \left(\sqrt{\frac{b}{3\sqrt{a}}}\right)^{21}\right)$$

which has the same

power of a and b.



equal.

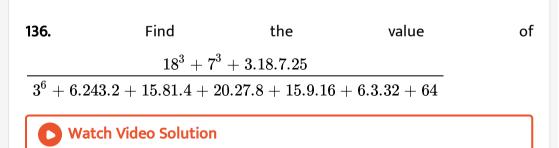
134. Find n, if the ratio of the fifth term from the beginning to the fifth

term from the end in the expansion of
$$\left(\sqrt[4]{2}+rac{1}{\sqrt[4]{3}}
ight)^n$$
 is $\sqrt{6}\!:\!1.$

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135. Simplify:
$$x^5 + 10x^4a + 40x^3a^2 + 80x^2a^3 + 80xa^4 + 32a^5$$
.

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137. Find the approximation of $\left(0.~99
ight)^5$ using the first three terms of its

expansion.

138. If for
$$n \in N$$
, $\sum_{k=0}^{2n} (-1)^k (.^{2n} C_k)^2 = A$, then find the value of $\sum_{k=0}^{2n} (-1)^k (k=2n) (.^{2n} C_k)^2.$

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139. There are two bags each of which contains n balls. A man has to select an equal number of balls from both the bags. Prove that the number of ways in which a man can choose at least one ball from each bag $is^{2n}C_n - 1$.

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140. Find the sum
$$\sum_{i=0}^r .^{n_1} C_{r-i} .^{n_2} C_i$$
 .

141. Prove that
$$\sum_{r=0}^{2n} \left(r.^{2n}\,C_r
ight)^2 = n^{4n}C_{2n}\,.$$

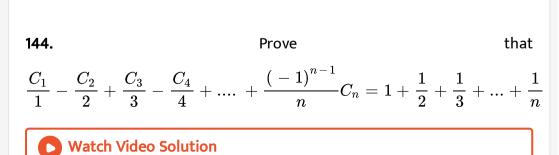
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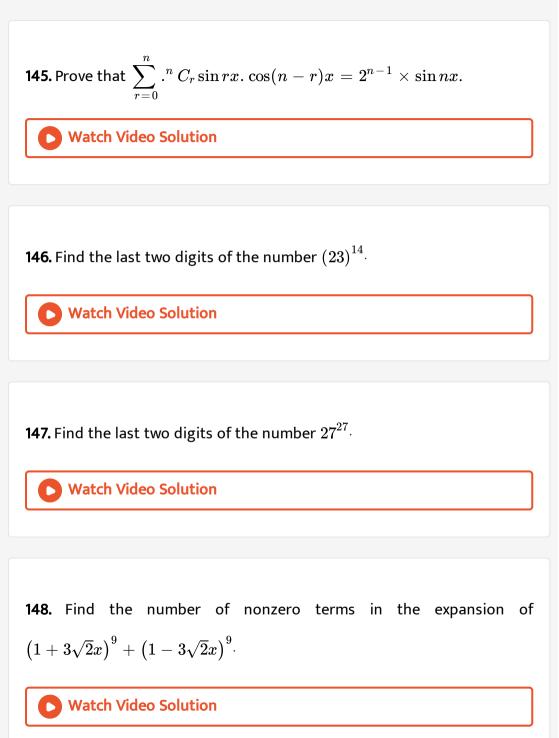
142. If k and n are positive integers and $S_k = 1^k + 2^k + 3^k + \ldots + n^k$,

then prove that
$$\sum\limits_{r=1}^m .^{m+1} C_r s_r = \left(n+1
ight)^{m+1} - \left(n+1
ight)$$

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143. Prove that
$$\sum_{r=1}^n {(-1)^{r-1} \left(1 + rac{1}{2} + rac{1}{3} + \ + rac{1}{r}
ight)} (.^n \, C_r) = rac{1}{n} \, .$$





149. Find the value of $\left(\sqrt{2}+1
ight)^6-\left(\sqrt{2}-1
ight)^6\cdot$

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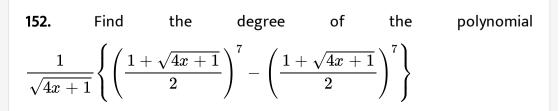
150. Using the binomial theorem (without using the formula for $.^{n} C_{r}$),

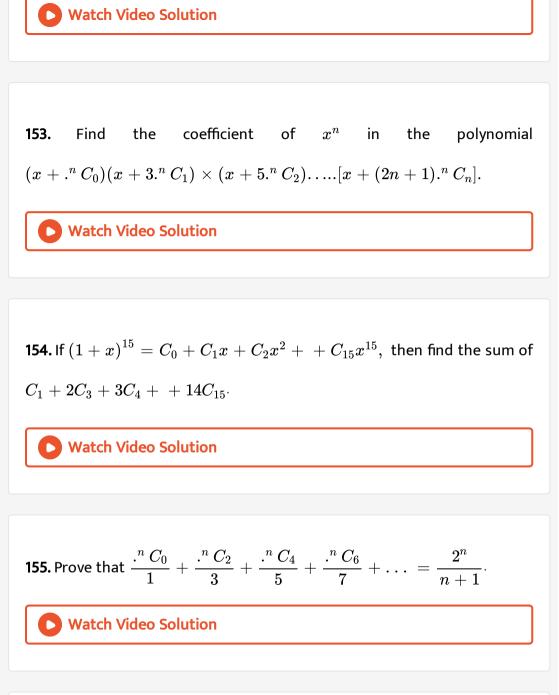
prove that

 $.^{n}C_{4} + .^{m}C_{2} - .^{m}C_{1}.^{n}C_{2} = .^{m}C_{4} - .^{m+n}C_{1}.^{m}C_{3} + .^{m+n}C_{2}.^{m}C_{2} - .^{m}C_{2}$

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151. Find the value of $.^{4n} C_0 + ^{4n} C_4 + ^{4n} C_8 + ... + {}^{4n} C_{4n}$.

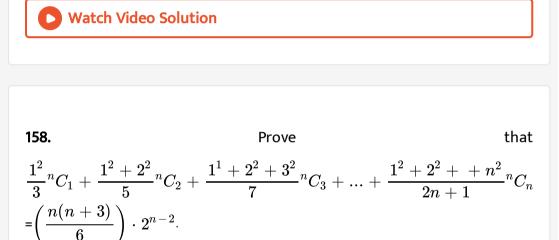




156. Find the sum `sumsum_(Olt=i



157. Show that the integer next above $\left(\sqrt{3}+1\right)^{2m}$ contains 2^{m+1} , as a factor.



159. Prove that

$$\frac{1}{n+1} = \frac{\cdot^n C_1}{2} - \frac{2(\cdot^n C_2)}{3} + \frac{3(\cdot^n C_3)}{4} - \dots + (-1)^{n+1} \frac{n(\cdot^n C_n)}{n+1}.$$
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160. Find the sum

$$2. \, .^{10} \, C_0 + \frac{2^2}{2}.^{10} \, C_1 + \frac{2^3}{3}.^{10} \, C_2 + \frac{2^4}{4}.^{10} \, C_3 + + \frac{2^{11}}{11}.^{10} \, C_{10}.$$

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161. If in the expansion of $\left(2x+5
ight)^{10}$, the numerically greatest term in equal to the middle term, then find the values of x

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162. Find the value of

$$\frac{1}{81^n} - \frac{10}{81^n} \cdot {}^{2n}C_1 + \frac{10^2}{81^n} \cdot {}^{2n}C_2 - \frac{10^3}{81^n} \cdot {}^{2n}C_3 + \dots + \frac{10^{2n}}{81^n}.$$
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163. Find the value of $5C_3 + 4C_2$

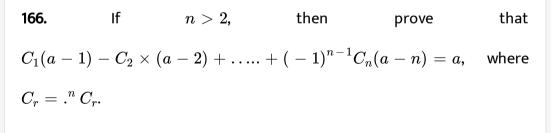
164. Find the sum
$$^{1}C_{0} + ^{2}C_{1} + ^{3}C_{2} + ... + ^{n+1}C_{n}$$
, where $C_{r} = ^{n}C_{r}$.



165. If
$$(1+x+x^2+\ldots +x^n)^n=a_0+a_1x+a_2x^2+\ldots a_{np}x^{np}$$
,

then find the value of $a_1 + 2a_2 + 3a_3 + \ldots + npa_{np}$.





167. Find the sum $C_0-C_2+C_4-C_6+\ldots$,where $C_r=^n C_r$.

A. $n(n+1)2^n - 1$

 $\mathsf{B.}\,n(n+3)2^n-2$

 $\mathsf{C.}\,2n.^{2n}\,C_n$

D. none of these

Answer: null

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168. If
$$x+y=1, ext{ prove that } \sum_{r=0}^n .^n C_r x^r y^{n-r}=1.$$

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169. Find the sum $3C_1 + 5C_2$

170. Prove that
$$rac{\cdot^n C_1}{2} + rac{\cdot^n C_3}{4} + rac{\cdot^n C_5}{6} + \ldots = rac{2^n - 1}{n+1}.$$

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171. If
$$(1+x)^n = \sum_{r=0}^n nC_r$$
 , show that $C_0 + \frac{C_1}{2} + + \frac{C_n}{n+1} = \frac{2^{n+1}-1}{n+1}$.

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172. If
$$\sum_{r=0}^{2n}a_r(x-2)^r=\sum_{r=0}^{2n}b_r, \left(x-3
ight)^r$$
 and $a_k=1$ for all $k\geq n$, then

 b_n is equal to

173.
$$3^{2n+2}-8n-9$$
 is divisible by

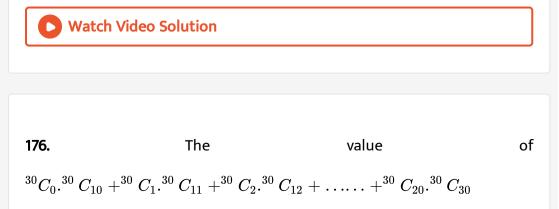
174. Statement 1: The number of distinct terms in $(1 + x + x^2 + x^3 + x^4)^{1000} is4001.$ Statement 2: The number of distinct terms in expansion $(a_1 + a_2 + + a_m)^n is^{n+m-1}C_{m-1}^{\cdot}$ Only conclusion I follows Only conclusion II follows Either I or II follows

Neither I nor II follows

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175. The product of 3rd and 8th term of a GP is 243. If its 4th term is 3. find

its 7th term.



177. If
$$f(x) = x^n, f(1) + rac{f^1(1)}{1} + rac{f^2(1)}{2!} + \dots rac{f^n(1)}{n!}, where f^r(x)$$

denotes the rth order derivative of f(x) with respect to x, is a. n b. 2^n c.

 2^{n-1} d. none of these

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178. The fractional part of
$$=\frac{2^{4n}}{15}$$
 is

179. The value of .¹⁵
$$C_0^2 - .^{15} C_1^2 + .^{15} C_2^2 - \dots - .^{15} C_{15}^2$$
 is
a. 15
b. -15
c. 0
d. 51



180. If the sum of the coefficients in the expansion of $(1-3x+10x^2)^n isa$ and if the sum of the coefficients in the expansion of $(1+x^2)^n isb$, then a. a=3b b. $a=b^3$ c. $b=a^3$ d. none of these

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181. If
$$\left(1+x-2x^2
ight)^6 = 1+a_1x+a_2x^2+\ldots +a_{12}x^{12}$$
 then

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182. Maximum sum of coefficient in the expansion of $\left(1-x\sin heta+x^2
ight)^n$

is

183. If the sum of the coefficients in the expansion of $(a + b)^n$ is 4096,

then the greatest coefficient in the expansion is



184. The number of distinct terms in the expansion of $\left(x + \frac{1}{x} + x^2 + \frac{1}{x^2}\right)^{15}$ is/are (with respect to different power of x is a)

 $255 \ \mathrm{b}. \, 61 \ \mathrm{c}. \, 127 \ \mathrm{d}.$ none of these

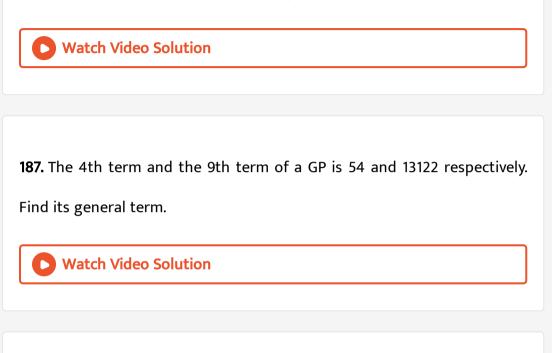
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185. The sum of the coefficients of even power of x in the expansion of

$$\left(1+x+x^2+x^3
ight)^5$$
i $s~256$ b. 128 c. 512 d. 64

186. Second term of a GP is 6 and its 5th term is 9th time of its 3rd term.

Find the GP. Consider each of the GP is positive.



188. If a,b,c are in GP Then prove that, $\log a$, $\log b$, $\log c$ are in AP.

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189. If the coefficient of x^7 in $\left[ax^2 + \left(\frac{1}{b}x\right)\right]^{11}$ equals the coefficient of x^{-7} in $\left[ax - \left(\frac{1}{bx^2}\right)\right]^{11}$ then a and b satisfy the relation

190. If the binomial coefficient of the $(2r+4)^{th}$ term and $(r-2)^{th}$ term in the expansion of $(1+x)^{18}$ are equal find the value of r.



191. If the coefficients of the rth, (r + 1)th, (r + 2)th terms is the expansion of $(1 + x)^{14}$ are in A.P, then the largest value of r is.

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192. If the three consecutive coefficients in the expansion of $(1 + x)^n$ are

28, 56, and 70, then the value of n is.



193. The expression
$$\left(\sqrt{2x^2+1}+\sqrt{2x^2-1}
ight)^6 + \left(rac{2}{\sqrt{2x^2+1}+\sqrt{2x^2-1}}
ight)^6$$
 is

polynomial of degree

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 194. Least positive integer just greater than
$$(1 + 0.00002)^{50000}$$
 is _____.

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195. If
$$U_n=\left(\sqrt{3}+1
ight)^{2n}+\left(\sqrt{3}-1
ight)^{2n}$$
 , then prove that

 $U_{n+1}=8U_n-4U_{n-1}$

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196. Prove that the coefficient of x^n in the expansion of $rac{1}{(1-x)(1-2x)(1-3x)}$ is $rac{1}{2} \left(3^{n+2}-2^{n+3}+1
ight)$

197.	The	value	of
(30, 0)(30, 10) - (30,	1)(30, 11) + (30, 2)(30)	$(0, 12) - \dots + (30, 20)$	0)(30, 3
, where $(n,r)=nC_r$ i	S		
a. $(30,10)$			
b. (30, 15)			
c. (60, 30)			
d. (31, 10)			
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198. If a, b, c are in AP, a, x, b are in GP , where as b, y and c also in GP. Then prove that x^2 , b^2 , y^2 are in AP.

199.
 Prove
 that

$$\frac{1}{m!} \cdot {}^n C_0 + \frac{n}{(m+1)!} \cdot {}^n C_1 + \frac{n(n-1)}{(m+2)!} \cdot {}^n C_2 + \dots + \frac{n(n-1)\dots \cdot 2 \times 1}{(m+n)!}$$

 Solution

200. If $n=12m(m\in N),\,$ prove that

$$egin{aligned} &\cdot^n C_0 - rac{\cdot^n C_2}{\left(2 + \sqrt{3}
ight)^2} + rac{\cdot^n C_4}{\left(2 + \sqrt{3}
ight)^4} - rac{\cdot^n C_6}{\left(2 + \sqrt{3}
ight)^6} + &= \ &(-1)^m igg(rac{2\sqrt{2}}{1 + \sqrt{3}}igg)^n. \end{aligned}$$

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201. Prove that in the expansion of $(1+x)^n(1+y)^n(1+z)^n$, the sum of

the coefficient of the terms of degree r is $.^{3n} C_r$.

$$.^{100} C_0^{100} C_2 + ^{100} C_2^{100} C_4 + ^{100} C_4^{100} C_6 + \ + ^{100} C_{98}^{100} C_{100} = rac{1}{2} ig[.^{200} C_{98} - ^{100}ig]$$

203. Prove that
$$\sum_{r=1}^{m-1} rac{2r^2 - r(m-2) + 1}{\left(m-r
ight)^m C_r} = m - rac{1}{m}.$$

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204. Find the coefficients of x^{50} in the expression $(1+x)^{1000} + x(1+x)^{999} + x^2(1+x)^{998} + ... + 1001x^{1000}$.

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205. If a, b, c are in GP and a, x, b, y are in AP Then prove that, $\frac{a}{x} + \frac{c}{y} = 2$

206. If $.^{n+1} C_{r+1} : {}^{n} C_{r} : {}^{n-1} C_{r-1} = 11:6:3$, then nr = 20 b. 30 c. 40 d. 50

207. If the last tem in the binomial expansion of
$$\left(2^{\frac{1}{3}} - \frac{1}{\sqrt{2}}\right)^n is\left(\frac{1}{3^{\frac{5}{3}}}\right)^{\log_3 8}$$
, then 5th term from the beginning is 210 b.

 $420 \mbox{ c. } 105 \mbox{ d. none of these}$

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208. Find the last two digits of the number $(23)^{14}$.

209. The value of x for which the sixth term in the expansion of

$$\left[2^{\log_2\sqrt{9^{x-1}+7}}+rac{1}{2^{rac{1}{5}\log_2\left(3^{x-1}+1
ight)}}
ight]^7$$
 is 84 is

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210. If the 6th term in the expansion of
$$\left(rac{1}{x^{8/3}}+x^2\log_{10}x
ight)^8$$
 is 5600,

then x equals

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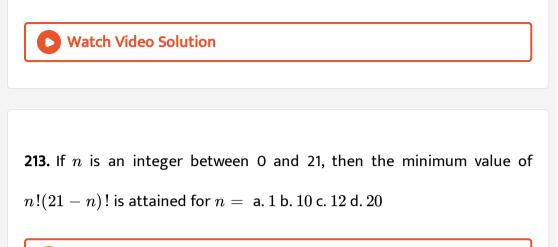
211. The total number of terms which are dependent on the value of x in

the expansion of $\left(x^2-2+rac{1}{x^2}
ight)^n$ is equal to 2n+1 b. 2n c. n d. n+1

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212. In the expansion of $(3^{-x/4} + 3^{5x/4})^n$ the sum of binomial coefficient is 64 and term with the greatest binomial coefficient exceeds





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214. If R is remainder when $6^{83}+8^{83}$ is divided by 49, then find the value of $\frac{R}{5}.$

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215. Let a and b be the coefficient of x^3 in $(1+x+2x^2+3x^3)^4$ and $(1+x+2x^2+3x^3+4x^4)^4$, respectively. Then the value of 4a/b is _____

216. Let
$$1+\sum_{r=1}^{10}\left(3^r.\,.^{10}\,C_r+r.\,.^{10}\,C_r
ight)=2^{10}ig(lpha.\,4^5+etaig)$$
 where

 $lpha,eta\in N$ and $f(x)=x^2-k^2+1.$ If lpha,eta lies between the roots of

f(x) = , the smalles positive integral value of k is _____.

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217. Let
$$a = 3^{1/224} + 1$$
 and for all $n \geq 3$,

let

$$f(n) = {^nC_0a^{n-1}} - {^nC_1a^{n-2}} + {^nC_2a^{n-3}} + ... + (\,-1)^{n-1} \cdot {^nC_{n-1}} \cdot a^0.$$

If the value of $f(2016)+f(2017)=3^k$, the value of K is

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218. If the constant term in the binomial expansion of $\left(x^2-rac{1}{x}
ight)^n, n\in N$ is 15, then find the value of n.

219. The largest value of x for which the fourth tem in the expansion

$$\left(5^{\left(rac{2}{5}
ight)(\log)_5\sqrt{4^x+44}}+rac{1}{5^{\log_5}\left(2^{(x-1)+7}
ight)^{rac{1}{3}}}
ight)^8$$
 is 336 is.

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220. The number of values in set of values of r for which

$${}^{23}C_r+2{}^{23}C_{r+1}+{}^{23}C_{r+2}\geq {}^{25}C_{15}$$
 is

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221. If the second term of the expansion $\left[a^{rac{1}{13}}+\left(rac{a}{\sqrt{a^{-1}}}
ight]is$ 14a^(5/2)

and $thevalue of(\nC_3)/(\nC_2) = \lambda$ then λ is

222. Given $(1-2x+5x^2-10x^3)(1+x)^n=1+a_1x+a_2x^2+...$

and that $a_1^2 = 2a_2$, then the value of n is



223. If
$$A + B = 90^o$$
 and tanA= $rac{4}{3}$,find cosecB.

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224. If X-k divides $x^3 - 6x^2 + 11x - 6$ =0, then k can't be equal to, (a) 1.

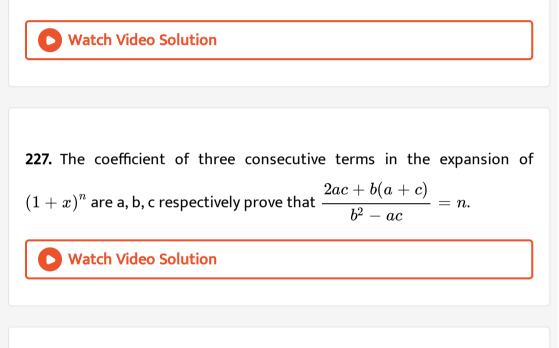
(b) 2.(c) 3.(d) 4

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225. Prove that $\sum_{r=1}^k {(-3)^{r-1} (3n)^C}_- {(2r-1)} = 0$, where k = 3n/2

and n is an even integer.

226. The coefficient of the middle term in the binomial expansion in powers of x of $(1 + \alpha x)^4$ and of $(1 - \alpha x)^6$ is the same, if lpha equals



228. The sum of G. P 3, 6, 12, ...1536.



229. Prove that $\left(25
ight)^{n+1}-24n+5735$ is divisible by $\left(24
ight)^2$ for all

 $n=1,2,\ldots$

230. The coefficient of 1/x in the expansion of $(1+x)^n(1+1/x)^n$ is (a).

 $\frac{n!}{(n-1)!(n+1)!} \text{ (b). } \frac{(2n)!}{(n-1)!(n+1)!} \text{ (c). } \frac{(2n)!}{(2n-1)!(2n+1)!} \text{ (d).}$

none of these

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231. Find the coefficient of x^5 in the expansion of $(1+x)^{21} + (1+x)^{22} + ... + (1+x)^{30}$.

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232. If
$$x^m$$
 occurs in the expansion of $\left(x+\left(rac{1}{x^2}
ight)
ight)^{2n}$ then the

coefficient of x^m is

233. If the coefficients of $5^{th}, 6^{th}$ and 7^{th} terms in the expansion of

 $\left(1+x
ight)^n$ are in A.P. then n=



234. If
$$ig(1+2x+x^2ig)^n=\sum_{r=0}^{2n}a_rx^r$$
 , then $a_r=$

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235. In the expansion of $\left(x^3-rac{1}{x^2}
ight)^n, n\in N$, if the sum of the coefficients of x^5andx^{10} is zero , then n is a. 25 b. 20 c. 15 d. none of these

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236. If the coefficients of rth and (r + 1)th terms in the expansion of $(3 + 7x)^{29}$ are equal, then r is equals to a. 15 b. 21 c. 14 d. none of these

237. In the expansion of $\left(1+3x+2x^2
ight)^6$, find the coefficient of x^{11} .



238. If
$$.^{n-1} C_r = \left(k^2-3
ight)^n C_{r+1}, ext{ then } ext{k belongs to}$$

- (a) $(-\infty, -2]$
- (b) $[2,\infty)$
- (c) $\left[-\sqrt{3},\sqrt{3}
 ight]$
- (d) $\left[\sqrt{3},2\right]$

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239. Prove that
$$rac{3!}{2(n+3)} = \sum_{r=0}^n {(-1)^r igg(rac{nC_r}{(r+3)C_3}igg)}$$

240. Find the 5th term of the GP. $\frac{5}{2}$, 1,

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241. The expression
$$\left(x+rac{(x^3-1)^{rac{1}{2}}}{2}
ight)^5+\left(x-rac{(x^3-1)^{rac{1}{2}}}{2}
ight)^5$$
 is a

polynomial of degree

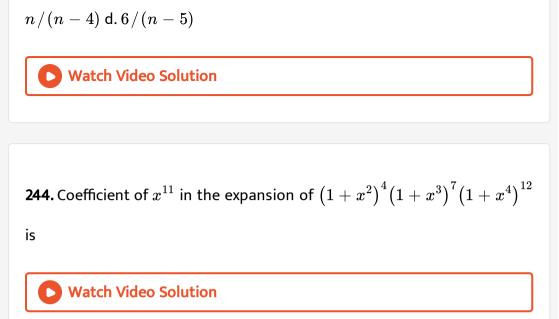
a. 5 b. 6 c. 7 d. 8

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242. Find
$$\left(rac{dy}{dx}
ight)$$
 of $\sin(\cos x)$ is

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243. In the binomial expansion of $(a-b)^n, n \ge 5$, the sum of the 5th and 6th term is zero. Then a/b equals (n-5)/6 b. (n-4)/5 c.



245. Give the integers r>1, n>2 and c0-efficients of $(3r)^th$ and

 $\left(r+2
ight)^{th}$ term in the binomial expansion of $\left(1+x
ight)^{2n}$ are equal then

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246. Find the coefficient of x^4 in the expansion of $\left(x/2 - 3/x^2
ight)^{10}$.

247. If C_r stands for nC_r , then the sum of the series $\frac{2\left(\frac{n}{2}\right)!\left(\frac{n}{2}\right)!}{n!}\left[C_0^2 - 2C_1^2 + 3C_2^2 - \dots + (-1)^n(n+1)C_n^2\right]$, where

n is an even positive integer, is

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

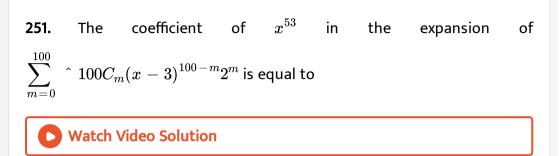
terms.

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249. The coefficient of
$$X^{24}$$
in the expansion of $(1+X^2)^{12}(1+X^{12})(1+X^{24})$

250. Find the sum of the GP $1 + 3 + 9 + 27 + \dots 12terms$



252. The coefficient of the term independent of x in the expansion of

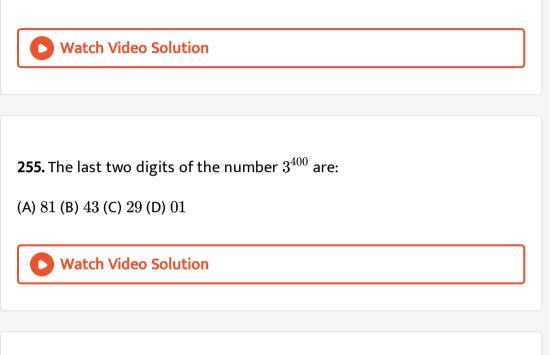
$$\left[rac{(x+1)}{x^{2/3}-x^{1/3}+1}-rac{(x-1)}{x-x^{1/2}}
ight]^{10}$$
 is

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253. In the expansion of $\left(1+x+x^3+x^4
ight)^{10}$, the coefficient of x^4 is a.. 40 C_4 b. $.^{10}$ C_4 c. 210 d. 310

254. If coefficient of $a^2b^3c^4$ in $(a+b+c)^m$ (where $m\in N$) is L (L
eq 0).

Then in same expansion coefficient of $a^4b^4c^1$ will be



256. The expression
$$\left(\sqrt{2x^2+1}+\sqrt{2x^2-1}
ight)^6+\left(rac{2}{\sqrt{2x^2+1}+\sqrt{2x^2-1}}
ight)^6$$
 is

polynomial of degree

257. A GP has common ratio 3, last term 486, if the sum of its terms is 728,

find its first term.

258. If $(1+2x+3x^2)^{10} = a_0 + a_1x + a_2x^2 + \dots + a_{20}x^{20}$, then a_1

equals a.10 b. 20 c. 210 d. none of these

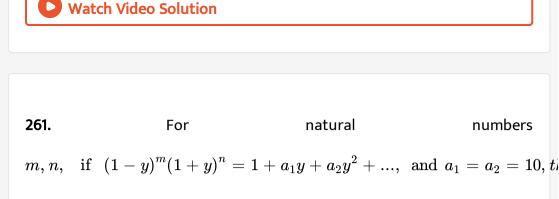
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259. Find the number of integral terms in the expansion of $\left(5^{\frac{1}{2}}+7^{\frac{1}{8}}\right)^{1024}$.

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260. For which of the following values of x, 5th term is the numerically greatest term in the expansion of $\left(1+x/3\right)^{10}$





262. If the middle term in the expansion of $\left(\frac{x}{2}+2\right)^8$ is 1120, then find the sum of possible real values of x.

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263. If
$$(1 + x)^n = C_0 + C_1 x + C_2 x^2 + ... + C_n x^n$$
,
then $C_0 - (C_0 + C_1) + (C_0 + C_1 + C_2) - (C_0 + C_1 + C_2 + C_3) + ... + (-1)^{n-1}(C_0 + C_1 + C_{n-1})$, where n a) is even integer b) is a positive value c) a negative value d) divisible by 2^{n-1}

264. In the expansion of
$$\left(x^2+1+rac{1}{x^2}
ight)^n, n\in N$$
,

265. The value of
$$.^{n}C_{1} + .^{n+1}C_{2} + .^{n+2}C_{3} + \ldots + .^{n+m-1}C_{m}$$
 is

equal to

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266. If
$$(1+x)^n = C_0 + C_1 x + C_2 x^2 + ... + C_n x^n$$
 , $n \in N$,then $C_0 - C_1 + C_2 - + (-1)^{n-1} C_{m-1}$, is equal to $(m < n)$

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267. The 10th term of
$$\left(3-\sqrt{rac{17}{4}+3\sqrt{2}}
ight)^{20}$$
 is (a) a irrational number (b)

a rational number (c) a positive integer (d) a negative integer

268. Find the geometric mean between 2a and $8a^3$



269. Let
$$\left(1+x^2
ight)^2(1+x)^n=\sum_{k=0}^{n+4}a_kx^k$$
.. If a_1,a_2 and a_3 aer in

arithmetic progression, then the possible value/values of n is/are

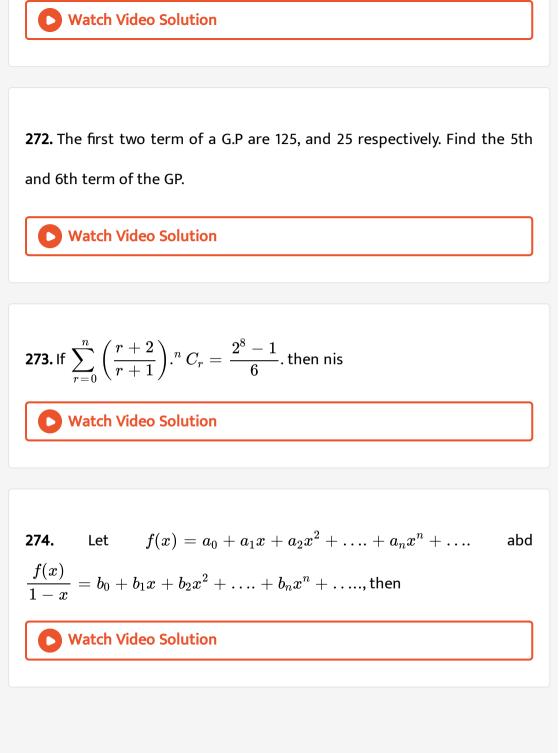
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270. The middle term in the expansion of $\left(rac{x}{2}+2
ight)^8$ is 1120, then $x\in R$

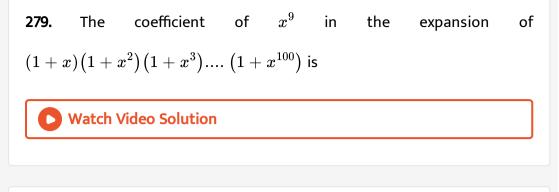
is equal to a. -2 b. 3 c. -3 d. 2

271. The sum of three numbers of GP is $\frac{39}{10}$ and their product is 1. Find

the numbers.



275. If
$$(1 + x^2)^n = \sum_{r=0}^n a_r x^r = (1 + x + x^2 + x^3)^{100}$$
. If $a = \sum_{r=0}^{300} a_r$,
then $\sum_{r=0}^{300} ra_r$ is
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276. The value of $\sum_{r=1}^{n+1} \left(\sum_{k=1}^n kC_r(r-1))(wherer, k, n in N')$ is equal to
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277. If $\frac{x^2 + x + 1}{1 - x} = a_0 + a_1 x + a_2 x^2 + \dots$, then $\sum_{r=1}^{50} a_r$ equal to
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278. Find $\frac{dy}{dt}$, if $y = \frac{1 - \cos t}{1 + \cos t}$ is



280. The coefficients of three consecutive terms of $\left(1+x
ight)^{n+5}$ are in the

ratio 5 : 10 : 14. Then n= _____

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281.

$$(1-x)^{-n} = a_0 + a_1 x + a_2 x^2 + \ + a_r x^r + , then a_0 + a_1 + a_2 + \ + a_r$$

If

is equal to

a.
$$\frac{n(n+1)(n+2)(n+r)}{r!}$$
b.
$$\frac{(n+1)(n+2)(n+r)}{r!}$$
c.
$$\frac{n(n+1)(n+2)(n+r-1)}{r!}$$

d. none of these



282. The value of
$$\sum_{r=0}^{20} r(20-r)((20)C_r)^2$$
 is equal to ?



283. The coefficient of x^{10} in the expansion of $\left(1+x^2-x^3
ight)^8$ is

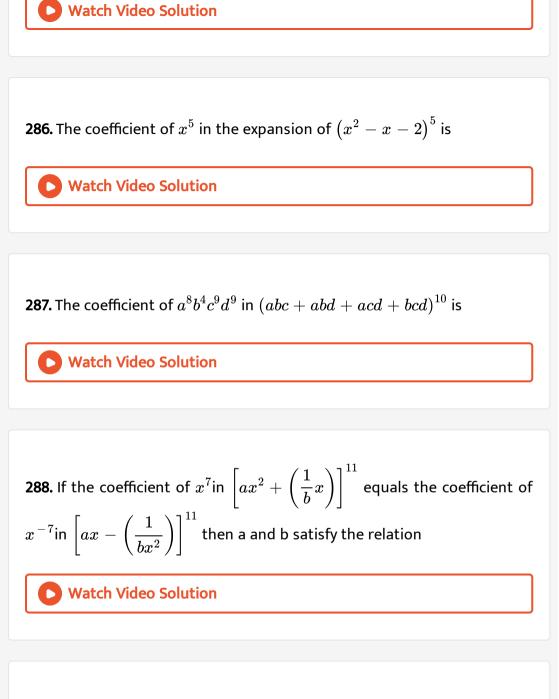
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284. If the term independent of x in the $\left(\sqrt{x}-rac{k}{x^2}
ight)^{10}$ is 405, then k

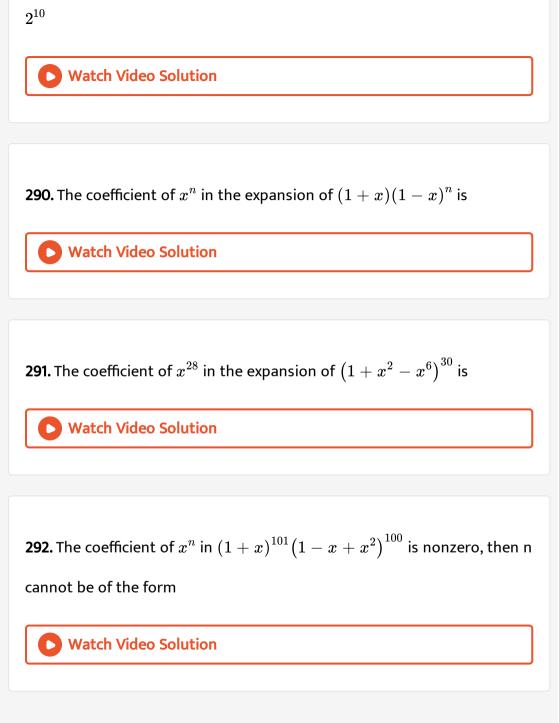
equals $2,\ -2$ b. $3,\ -3$ c. $4,\ -4$ d. $1,\ -1$

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285. The coefficient of x^2y^3 in the expansion of $(1 - x + y)^{20}$ is (a) $\frac{20!}{213!}$ b. $-\frac{20!}{213!}$ c. $\frac{20!}{5!2!3!}$ d. none of these



289. If
$$(1+x)^5 = a_0 + a_1x + a_2x^2 + a_3x^3 + a_4x^4 + a_5x^5$$
, then the value of $(a_0 - a_2 + a_4)^2 + (a_1 - a_3 + a_5)^2$ is equal to 243 b. 32 c. 1 d.



293. prove that
$$\sum_{r=0}^{n} (-1)^r \cap nC_r$$
. $[\frac{1}{2^r} + \frac{3^r}{2^{2r}} + \frac{7^r}{2^{3r}} + \frac{15^r}{2^{4r}} + \dots$ up to m terms]= $\frac{2^{mn} - 1}{2^{mn}(2^n - 1)}$

,

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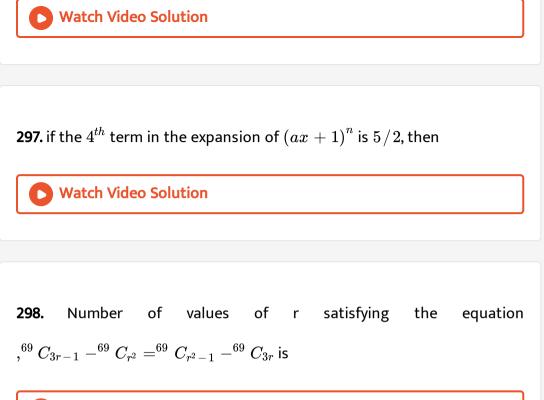
294. In the expansion of
$$\left(7^{1/3} + 11^{1/9}
ight)^{6561}$$

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295. If for
$$z$$
 as real or complex,
 $(1+z^2+z^4)^8=C_0+C_1z^2+C_2z^4+...+C_{16}z^{32}then$ prove that
 $C_0-C_1+C_2-C_3+....+C_{16}=1$ and
 $C_0+C_3+C_6+C_{12}+C_{15}=3^7$

296. The sum of the coefficient in the expansion of $\left(1+ax-2x^2
ight)^n$ is



299. If $\left(4 + \sqrt{15}
ight)^n = I + f$, where n is an odd natural number, I is an

integer and ,then

300. In the expansion of $(x + a)^n$ if the sum of odd terms is P and the sum of even terms is Q, then



301. If the coefficients of the rth, (r + 1)th, (r - 2)th terms is the expansion of $(1 + x)^{14}$ are in A.P, then the largest value of r is.

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302. The value/value of x in the expression $\left(x+x^{\log_{10}x}
ight)^5$ if the third term

in the expansion is 10, 00, 000is/are



303. Let $R = \left(5\sqrt{5} + 11
ight)^{2n+1}$ and f=R-[R] where [] is the greatest integer

function. Prove that Rf= 4^{2n+1}



304. If |x| < 1, then the coefficient of x^n in expansion of $\left(1+x+x^2+x^3+\ldots
ight)^2$ is

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305. The coefficient of
$$x^5 \in \left(1+2x+3x^2+
ight)^{-3/2} is(|x|<1)$$

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306. If x is so small that x^3 and higher powers of x may be neglected,

then
$$\frac{(1+x)^{\frac{3}{2}} - \left(1 + \frac{1}{2x}\right)^3}{(1-x)^{\frac{1}{2}}}$$
 may be approximated as
A. $3x + \frac{3}{8}x^2$
B. $1 - \frac{3}{8}x^2$
C. $\frac{x}{2} - \frac{3}{x^2}$
D. $-\frac{3}{8}x^2$

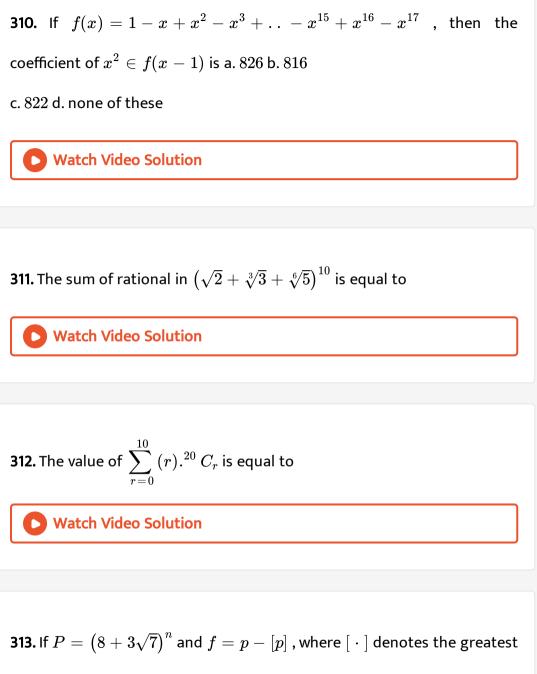
307. If x is positive, the first negative term in the expansion of $(1+x)^{27/5}is(|x|<1)$

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308. Value of
$$\sum_{k=1}^\infty \sum_{r=0}^k rac{1}{3^k} (kC_r)$$
 is $rac{2}{3}$ b. $rac{4}{3}$ c. 2 d. 1

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309. If the expansion in powers of
$$x$$
 of the function $\frac{1}{(1-ax)(1-bx)}$ is
 $aa_0 + a_1x + a_2x^2 + a_3x^3 + thena_n is$ $a.\frac{b^n - a^n}{b-a}$ $b.$ $\frac{a^n - b^n}{b-a}$ c.
 $\frac{b^{n+1} - a^{n+1}}{b-a}$ $d.$ $\frac{a^{n+1} - b^{n+1}}{b-a}$



integers function, then the value of p(1-f) is equal to

314. Find the GP whose first term is 64 and next term is 32.

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315. The fifth term of GP is 81 and second term is 24. Find the GP



316. The value of x for which the sixth term in the expansion of

$$\left[2^{\log_2\sqrt{9^{x-1}+7}}+rac{1}{2^{rac{1}{5}\log_2\left(3^{x-1}+1
ight)}}
ight]^7$$
 is 84 is

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317. Find the 7th term of the GP,
$$\sqrt{3}+1$$
, 1 , $rac{\sqrt{3}-1}{2}$,....

318. The number $51^{49} + 51^{48} + 51^{47} + \dots + 51 + 1$ is divisible by a.

10 b. 20 c. 25 d. 50



319. If
$$\sum_{r=0}^{n} \frac{r}{{}^{n}C_{r}} = \sum_{r=0}^{n} \frac{n^{2} - 3n + 3}{2 \cdot {}^{n}C_{r}}$$
, then find n

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320. If
$$(1+x)^n = C_0 + C_1 x + C_2 x^2 + \dots + C_n x^n$$
, then show that
the sum of the products of the coefficients taken two at a time,
represented by $\sum_{0 \le i < j \le n} {}^n c_i \, {}^n c_j$ is equal to $2^{2n-1} - \frac{(2n)!}{2(n!)^2}$

321. If
$$\sum_{r=0}^n \left\{a_r(x-lpha+2)^r-b_r(lpha-x-1)^r
ight\}=0$$
, then

322. Let
$$a=\left(2^{1\,/\,401}-1
ight)$$
 and for each

 $n\geq 2,\, letb_n=^n C_1+^n C_2\dot{a}+^n C_3a^2+.....+^n C_n\cdot a^{n-1}$. Find the

value of $(b_{2006} - b_{2005})$.

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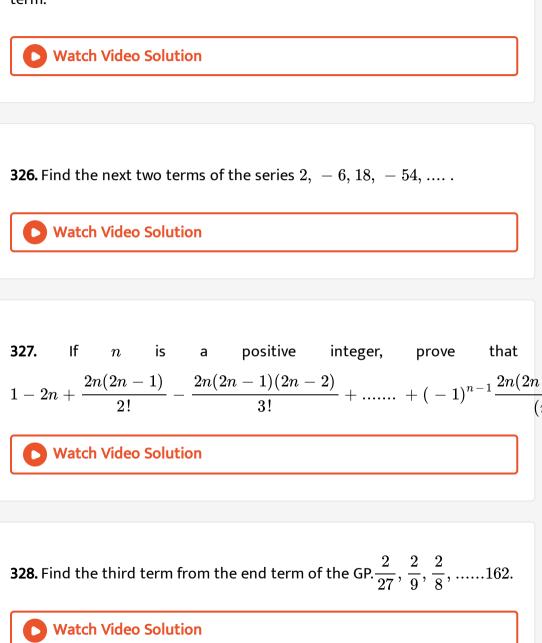
323. Prove that
$$\sum_{r=0}^n .^n C_r (\,-1)^r ig[i^r + i^{2r} + i^{3r} + i^{4r} ig] = 2^n + 2^{n+1} \cos(n\pi/4)$$
 , where $i=\sqrt{-1}$

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324. The coefficients of
$$x^n$$
 in $\left(1+rac{x}{1!}+rac{x^2}{2!}+\ldots+rac{x^n}{n!}
ight)^2$ is

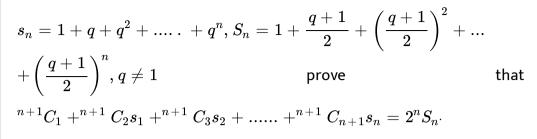
325. If the first and third term is $2 \ {\rm and} \ 8$ respectively. Find its second

term.



329.

Given,



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330. The sum of
$$1+nigg(1-rac{1}{x}igg)+rac{n(n+1)}{2!}igg(1-rac{1}{x}igg)^2+....\infty$$

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331.
$$\sum_{k=1}^{\infty} k \left(1 - \frac{1}{n} \right)^{k-1}$$
 =?

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332. The coefficient of x in the expansion of $\left\{\sqrt{1+x^2}-x\right\}^{-1}$ in ascending powers of x, when |x| < 1, is a. 1 b. $\frac{1}{2}$ c. $-\frac{1}{2}$ d. $-\frac{1}{8}$

333.
$$1+rac{1 imes 4}{3 imes 6}x^2+rac{1 imes 4 imes 7}{3 imes 6 imes 9}x^3+$$
 ----- is equal to

334. The value of
$$\sum_{r=1}^{15} \frac{r2^r}{(r+2)!}$$
 is (a). $\frac{(17)! - 2^{16}}{(17)!}$ (b). $\frac{(18)! - 2^{17}}{(18)!}$ (c). $\frac{(16)! - 2^{15}}{(16)!}$ (d). $\frac{(15)! - 2^{14}}{(15)!}$

335.
$$(n+2)$$
.ⁿ $C_0 2^{n+1}$.ⁿ $C_1 2^n + n$.ⁿ $C_2 2^{n-1} - \dots$ is equal to

336. The value of
$$\sum_{r=0}^{20}{(-1)^rrac{.^{50}C_r}{r+2}}$$
 is equal to

337. In the expansion of $[(1+x)(1-x)]^2$, the coefficient of x^n will be

338. If a, b, c are in GP and a, x, b, y, c ar in AP. then prove that, $\frac{1}{x} + \frac{1}{y} = \frac{2}{b}$

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339. Statement 1: ${}^{m}C_{r} + {}^{m}C_{r-1}({}^{n}C_{1}) + {}^{m}C_{r-2}({}^{n}C_{2}) + + {}^{n}C_{r} = 0$,

if m + n < r

Statement 2: ${}^{n}C_{r} = 0$, if n < r

(a) Statement 1 and Statement 2, both are correct. Statement 2 is the correct explanation for Statement 1.

(b) Statement 1 and Statement 2, both are correct. Statement 2 is not the correct explanation for Statement 1.

(c) Statement 1 is true but Statement 2 is false.

(d) Statement 2 is true but Statement 1 is false.

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$$\textbf{340.} 1 + \left(\frac{1}{4}\right) + \left(\frac{1 \cdot 3}{4 \cdot 8}\right) + \left(\frac{1 \cdot 4 \cdot 7}{4 \cdot 8 \cdot 12}\right) + =$$

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341. If
$$|x| < 1, then 1 + n \left(\frac{2x}{1+x} \right) + \frac{n(n+1)}{2!} \left(\frac{2x}{1+x} \right)^2 +$$
 is

equal to

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342. If a, b, c are in AP also in GP Then show that, a=b=c

343. The sum of the GP $rac{x+y}{x-y}, 1, rac{x-y}{x+y}, ...$.

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344. Statement 1: In the expansion of $(1+x)^{41}(1-x+x^2)^{40}$, the coefficient of x^{85} is zero.

Statement 2: In the expansion of $(1+x)^{41} and ig(1-x+x^2ig)^{40}, x^{85}$ term does not occur.

(a) Statement 1 and Statement 2, both are correct. Statement 2 is the correct explanation for Statement 1

(b) Statement 1 and Statement 2, both are correct. Statement 2 is not the

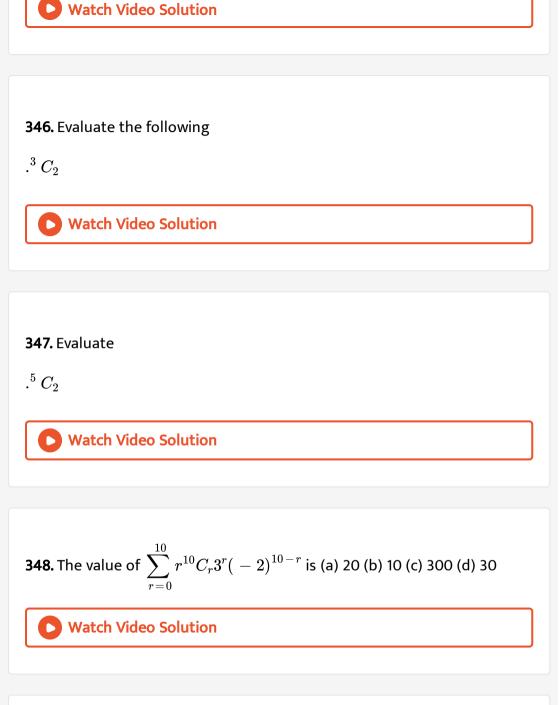
correct explanation for Statement 1

(c) Statement 1 is correct but Statement 2 is not correct.

(d) Both Statement 1 and Statement 2 are not correct.

345. The coefficient of
$$x^n$$
 in $\left(1+x+rac{x^2}{2!}+rac{x^3}{3!}+\ldots+rac{x^n}{n!}
ight)^3$ is





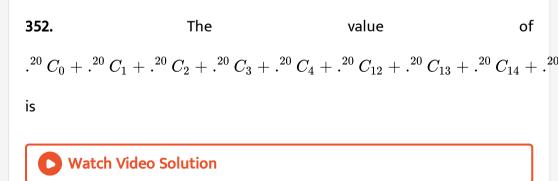
349. Find n if $nP_1=2$

350. Evaluate

 $.^5 P_2$

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351. The value of
$$\frac{\cdot^n C_0}{n} + \frac{\cdot^n C_1}{n+1} + \frac{\cdot^n C_2}{n+2} + \ldots + \frac{\cdot^n C_n}{2n}$$



353.

$$ig(3+x^{2008}+x^{2009}ig)^{2010}=a_0+a_1x^2+....\,+a_nx^n,a_0-rac{1}{2}a_1-rac{1}{2}a_2+a_3$$

.... is



354. Find the seventh term of the G.P: $1, \sqrt{3}, 3, 3\sqrt{3}, \ldots$.

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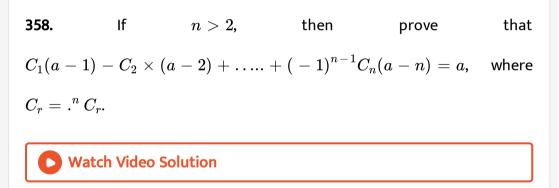
355. Find the 10th term of the G.P. : 12, 4,
$$1\frac{1}{3}$$
,....

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356. If
$$(1+x)^n = C_0 + C_1 x + C_2 x^2 + \ldots + C_n x^n$$
, then

$$C_0C_2 + C_1C_3 + C_2C_4 + \ldots + C_{n-2}C_n =$$

357. The value of
$$(\lim_{n\to\infty})_{n\to\infty}\sum_{r=1}^n \left(\sum_{t=0}^{r-1} \frac{1}{5^n} \cdot C_r \cdot C_t \cdot 3^t\right)$$
 is equal to



359. Find the nth term of the series: 1, 2, 4, 8,



360. The remainder, if $1 + 2 + 2^2 + 2^3 + \ldots + 2^{1999}$ in divided by 5 is

361. Largest real value for x such that
$$\sum_{k=0}^{4} \left(\frac{3^{4-k}}{(4-k)!} \right) \left(\frac{x^k}{k!} \right) = \frac{32}{3}$$



362. If in the expansion of $(a - 2b)^n$, the sum of 5^{th} and 6^{th} terms is 0, then the values of $\frac{a}{b}$ is **Watch Video Solution**

363. The number of real negative terms in the binomial expansion of

 $\left(1+ix
ight)^{4n-2}, n\in N, x>0$ is