CHAPTER 8
BINOMIAL THEOREM

IMPROVEMENT 2018

1. a) Write the expansion of $(a+b)^n$. (1)

   b) Find the coefficient of $x^5 y^7$ in the expansion of $(x-2y)^{12}$ (2)

   c) Show that $9^{n+1} - 8n - 9$ is divisible by 64. (3)

MARCH 2018

2. a) Which one of the following has its middle terms independent of x? (1)

   i) $\left(x+\dfrac{1}{x}\right)^{10}$ ii) $\left(x+\dfrac{1}{x}\right)^{9}$

   iii) $\left(x^2+\dfrac{1}{x}\right)^{9}$ iv) $\left(x^2+\dfrac{1}{x}\right)^{10}$

   b) Write the expansion of $\left(x^2+\dfrac{3}{x}\right)^{4}$ (2)

   c) Determine whether the expansion of $\left(x^2-\dfrac{2}{x}\right)^{18}$ a term containing x^{10}. (3)

IMPROVEMENT 2017

3. a) The number of terms in the expansion of $(x+a)^9 = \ldots\ldots$ (1)

   i) 9   b) 10

   iii) 8   iv) 5

   b) Find $(a+b)^4 - (a-b)^4$ (2)

   c) Hence evaluate $\left(\sqrt{3}+\sqrt{2}\right)^4 - \left(\sqrt{3}-\sqrt{2}\right)^4$ (2)

MARCH 2017

4. Consider the expansion of $\left(x+\dfrac{1}{x}\right)^{10}$

a) The number of terms in the expansion is ……..

   i) 10   ii) 9

   iii) 11   iv) 12   (1)

b) Find the term which is independent of x in the above expansion. (3)

(4)

IMPROVEMENT 2016

5. a) Write the expansion of $(a+b)^4$ (2)

   b) Evaluate: $\left(\sqrt{5}+\sqrt{6}\right)^4 + \left(\sqrt{5}-\sqrt{6}\right)^4$ (2)

MARCH 2016

6. a) The 8th terms is the expansion of $\left(\sqrt{2}+\sqrt{3}\right)^7$ is ……..

   i) $27\sqrt{2}$ ii) $27\sqrt{3}$

   iii) $72\sqrt{2}$ iv) $27\sqrt{3}$ (1)

   b) Find the term independent of x in the expansion of $\left(x+\dfrac{1}{2x}\right)^{18}; x>0$ (3)

IMPROVEMENT 2015

7. a) Number of terms in the expansion of $\left(x+\dfrac{1}{x}\right)^{20}$ is ……..

   i) 19   ii) 20

   iii) 21   iv) 22   (1)

   b) Consider the expansion of $\left(3x^2-\dfrac{1}{3x}\right)^{9}$.

   Find the coefficient of x^6 and the term independent of x. (4)

MARCH 2015

8. a) The number of terms in the expansion of

$\left(x - \dfrac{1}{x} \right)^{2n}$ is …………...

i) $n+1$ ii) n

iii) $2n+1$ iv) $2n+2$ (1)

b) Find a, if the 17th term and 18th term of

the expansion of $(2+\alpha)^{50}$ are equal.   (3)

IMPROVEMENT 2014

9. a) Write the expansion of $(a+b)^{n}$, where

    n is any positive integer.   (1)

b) Find the value of $'\alpha'$ if the 17th term and

    18th term in the expansion of $(2+a)^{50}$

    are equal.   (4)

MARCH 2014

10. a) Write the number of terms in the

    expansion of $(a-b)^{2n}$ (1)

b) Find the general term in the expansion of

    $(x^{2}-yx)^{12}, x \neq 0$ (2)

c) Find the coefficient of $x^{6}y^{3}$ in the

    expansion of $(x+2y)^{9}$ (2)

IMPROVEMENT 2013

11. a) The number of terms in the expansion of

    $\left(\dfrac{x}{3} + 9y \right)^{10}$ is ……………   (1)

b) Find the middle term in the above

    expansion.   (3)

MARCH 2013

12. a) Find the number of terms in the expansion of

    $\left(x - \dfrac{1}{x} \right)^{14}$ (1)

b) Find the general term in the expansion of

$\left(x - \dfrac{1}{x} \right)^{14}$ (2)

c) Find the term independent of x in the above

    expansion.   (1)

IMPROVEMENT 2012

13. Find $(x+y)^{4} - (x-y)^{4}$. Hence evaluate:

    $\left(\sqrt{5} + \sqrt{6} \right)^{4} - \left(\sqrt{5} - \sqrt{6} \right)^{4}$ (4)

MARCH 2012

14. a) Find the general term in the expansion of

    $\left(\dfrac{x}{2} - \dfrac{2}{x} \right)^{10}$ (2)

b) Find the term independent of x in the above

    expansion.   (2)

IMPROVEMENT 2011

15. Consider the expansion of $\left(x^{3} + \dfrac{1}{x} \right)^{8}$

a) Write the general term in the expansion.   (2)

b) Find the coefficient of term containing x^{8} . (2)

MARCH 2011

16. Consider the expansion of $\left(\dfrac{x}{9} + 9y \right)^{2n}$

i) The number of terms in the above expansion is

    ………….

    a) 2n   b) n+1

    c) 2n+1   d) 2n−1   (1)

ii) What is its $(n+1)^{th}$ term   (1)

iii) If n = 5, Find its middle term.   (2)

IMPROVEMENT 2010

17. Consider the expansion of $\left(x^{2} - \dfrac{1}{3x} \right)^{9}$

a) Find the coefficient of x^9. (2)

b) Find the term which is independent of x. (2)

MARCH 2010

18. i) Find the general term in the expansion of

$$\left(3x^2 - \frac{1}{3x}\right)^9$$

   ii) Find the term independent of x in the above expansion. (2)

IMPROVEMENT 2009

19. a) Write the general term in the expansion of

$$\left(\frac{3x^2}{2} - \frac{1}{3x}\right)^6$$ (2)

   b) Find the term independent of x in the

expansion of $\left(\frac{3x^2}{2} - \frac{1}{3x}\right)^6$ (2)

MARCH 2009

20. a) Write the general term in the expansion of

$$\left(x^2 - y\right)^6.$$ (2)

   b) Find the term independent of x in the

expansion of $\left(\frac{3}{2}x^2 - \frac{1}{3x}\right)^6$ (2)

MARCH 2008

21. a) Using binomial theorem, find the expansion of

$$\left(1 + x\right)^a$$ (1)

   b) Obtain the expansion for $\left(x^2 + \frac{2}{x}\right)^4$, where

$x \neq 0$. (2)

THOMAS EDISON

I will not say I failed 1000 times , I will say that I discovered there are 1000 ways that can cause failure - -

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