31/07/2020

Mulund Municipal Secondary School
Std 8th Semi English
Chapter 5th
Expansion formulae

* Expansion Formulae

i] $(a+b)^2 = a^2+2ab+b^2$

ii] $(a-b)^2 = a^2-2ab+b^2$

iii] $(a+b)(a-b) = a^2-b^2$

iv] $(x+a)(x+b) = x^2+(a+b)x+ab$

v] $(a+b)^3 = a^3+3a^2b+3ab^2+b^3$

vi] $(a-b)^3 = a^3-3a^2b+3ab^2-b^3$

vii] $(a+b)^3 = a^3+b^3+3ab(a+b)$

viii] $(a-b)^3 = a^3-b^3-3ab(a-b)$

ix] $(a+b+c)^2$
$= a^2+b^2+c^2+2ab+2bc+2ac$

x] a^3+b^3
$= (a+b)^3-3ab(a+b)$

xi] a^3-b^3
$= (a-b)^3+3ab(a-b)$

xii] $a^2+b^2 = (a+b)^2-2ab$

xiii] $a^2+b^2 = (a-b)^2+2ab$

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Std 8th Mathematics

Expansion Formulae

Practice Test.

Marks 10

Que] Fill Proper terms in the following boxes.

i] $(x+2y)^2 = x^2 + \square + \square^2 = x^2 + \square + 4y^2$

ii] $(2x-5y)^2 = \square^2 - 20xy + \square^2 = \square - 20xy + \square$

iii] $(101)^2 = (100+1)^2 = \square^2 + 2 \times 100 \times 1 + \square^2 = \square + \square + 1$

iv] $(98)^2 = (100-2)^2 = \square^2 - 2 \times 100 \times 1 + \square^2 = \square = \square$

v] $(5m+3n)(5m-3n) = \square^2 - \square^2 = \square = \square - \square$

— : Best of Luck : —

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Std 8th Mathematics

Practice Set 5.1

1] Expand.

i] $(a+2)(a-1) = a^2 + (2-1)a + 2\times(-1) = a^2 + a - 2$

2] $(m-4)(m+6) = m^2 + [(-4)+6]m + (-4)\times 6 = m^2 + 2m - 24$

3] $(p+8)(p-3) = p^2 + [8+(-3)]p + 8\times(-3) = p^2 + 5p - 24$

4] $(13+x)(13-x) = (13)^2 - (x)^2 = 169 - x^2$

5] $(3x+4y)(3x+5y) = (3x)^2 + [4y+5y]\times 3x + (4y\times 5y)$
$= 9x^2 + 9y \times 3x + 20y^2 = 9x^2 + 27x + 20y^2$

6] $(9x-5t)(9x+3t) = (9x)^2 + [-5t+3t]9x + (-5t)\times 3t = 81x^2 - 2t\times 9x - 15t^2$
$= 81x^2 - 18tx - 15t^2$

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Std 8th Mathematics

Expansion formulae

Q1] Expand.

7] $\left(m+\frac{2}{3}\right)\left(m-\frac{7}{3}\right)$

$= m^2 + \left[\frac{2}{3}-\frac{7}{3}\right]m + \frac{2}{3}\times\left(\frac{-7}{3}\right)$

$= m^2 - \frac{5}{3}m - \frac{14}{9}$

8] $\left[x+\frac{1}{x}\right]\left[x-\frac{1}{x}\right]$

$= [x]^2 - \left[\frac{1}{x}\right]^2$

$= x^2 - \frac{1}{x^2}$

9] $\left[\frac{1}{y}+4\right]\left[\frac{1}{y}-9\right] = \left[\frac{1}{y}\right]^2 + \left[4-9\right]\frac{1}{y} + 4\times(-9)$

$= \frac{1}{y^2} - 5\times\frac{1}{y} - 36$ $= \frac{1}{y^2} - \frac{5}{y} - 36$

Practice Set 5.1 & 5.2

Practice Set 5.2

1] Expand.

1] $(k+4)^3 = k^3 + 3\times k^2\times 4 + 3\times k\times 4^2 + (4)^3$

$= k^3 + 12k^2 + 3\times k\times 16 + 64$

$= k^3 + 12k^2 + 48k + 64$

2] $(7x+8y)^3 = (7x)^3 + 3\times(7x)^2\times 8y + 3\times 7x\times(8y)^2 + (8y)^3$

$= 343x^3 + 3\times 49x^2\times 8y + 3\times 7x\times 64y^2 + 512$

$= 343x^3 + 147\times 8x^2y + 3\times 448\,xy^2 + 512$

$= 343x^3 + 1176x^2y + 1344xy^2 + 512$

$= 343x^3 + 1176x^2y + 1344xy^2 + 512$

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Std 8th Mathematics

Expansion Formulae

Practice set 5.

Q.1] Expand

3] $(7+m)^3 = (7)^3 + 3\times 7^2 \times m + 3\times 7 \times m^2 + m^3$

$= 343 + 3\times 49 \times m + 21m^2 + m^3$

$= 343 + 147m + 21m^2 + m^3$

4] $(52)^3 = (50+2)^3 = (50)^3 + 3\times(50)^2\times 2 + 3\times 50\times 2^2 + 2^3$

$= 125000 + 3\times 2500\times 2 + 150\times 4 + 8$

$= 125000 + 15000 + 600 + 8$

$= 140608$

125000
$+ \quad 15000$
$+ \quad 600$
$+ \quad 8$
140608

$7^3 = 7\times 7\times 7$

$= 49\times 7$

$= 343$

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Std 8th Mathematics

Expansion formulae

Practice set 5.2

Q1] Expand

5] $(101)^3 = (100+1)^3$

$= (100)^3 + 3\times(100)^2\times 1 + 3\times 100\times(1)^2 + 1^3$

$= 1000000 + 3\times 10000 + 300 + 1$

$= 1030301$

1000000
+ 30000
+ 300
+ 1
1030301

6] $\left(x+\frac{1}{x}\right)^3 = x^3 + 3\times x^2\times\frac{1}{x} + 3\times x\times\left(\frac{1}{x}\right)^2 + \left(\frac{1}{x}\right)^3$

$= x^3 + 3x + \frac{3}{x} + \frac{1}{x^3}$

7] $\left(2m+\frac{1}{5}\right)^3 = (2m)^3 + 3\times(2m)^2\times\frac{1}{5} + 3\times 2m\times\left(\frac{1}{5}\right)^2 + \left(\frac{1}{5}\right)^3$

$= 8m^3 + 3\times 4m^2\times\frac{1}{5} + 3\times 2m\times\frac{1}{25} + \frac{1}{125} = 8m^3 + \frac{12m^2}{5} + \frac{6m}{25} + \frac{1}{125}$