Binomial Theorem for Expansion Practice Sheet 1
Expand the binomial using the Binomial Theorem.

1. $(10x + 12y)^1$

2. $(6x + 5y)^2$

3. $(3x + 5y)^4$

4. $(x + 2y)^3$

5. $(15x + 14y)^1$

Binomial Theorem for Expansion Practice Sheet 1

ANSWER KEY

1. Step 1: Binomial expressions contain two terms.
The first terms is seen as a^n and the last term is seen as b^n.
When binomial expressions are raised to a power, they can be
expanded using the following expansion formulas.
$(a + b)^0 = 1$
$(a + b)^1 = a + b$
$(a + b)^2 = a^2 + 2ab + b^2$
$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$
$(a + b)^4 = a^4 + 4a^3b + 6a^2b^2 + 4ab^3 + b^4$

Step 2: In this case, the binomial is raised to the first power, so
we will use this formulae:
$(a + b)^1 = a + b$

Step 3: We will insert our values into the formula:
$(10x + 12y)^1$

Answer: 5x + 6y

2. Step 1: Binomial expressions contain two terms.
The first terms is seen as a^n and the last term is seen as b^n.
When binomial expressions are raised to a power, they can be
expanded using the following expansion formulas.
$(a + b)^0 = 1$
$(a + b)^1 = a + b$
$(a + b)^2 = a^2 + 2ab + b^2$
$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$
$(a + b)^4 = a^4 + 4a^3b + 6a^2b^2 + 4ab^3 + b^4$

Step 2: In this case, the binomial is raised to the second power, so we will use this formulae:

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

Step 3: We will insert our values into the formula:

$(6x)^2 + 2(6x)(5y) + (5y)^2$

Answer: $36x^2 + 60xy + 25y^2$

3. Step 1: Binomial expressions contain two terms.
The first terms is seen as a^n and the last term is seen as b^n.
When binomial expressions are raised to a power, they can be expanded using the following expansion formulas.

$(a + b)^0 = 1$
$(a + b)^1 = a + b$
$(a + b)^2 = a^2 + 2ab + b^2$
$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$
$(a + b)^4 = a^4 + 4a^3b + 6a^2b^2 + 4ab^3 + b^4$

Step 2: In this case, the binomial is raised to the fourth power, so we will use this formulae:

$(a + b)^4 = a^4 + 4a^3b + 6a^2b^2 + 4ab^3 + b^4$

Step 3: We will insert our values into the formula:

$(3x)^4 + 4(3x)^3(5y) + 6(3x)^2(5y)^2 + 4(3x)(5y)^3 + (5y)^4$

Answer: $81x^4 + 540x^3y + 1350x^2y^2 + 1500xy^3 + 625y^4$

4. Step 1: Binomial expressions contain two terms.
The first terms is seen as a^n and the last term is seen as b^n.
When binomial expressions are raised to a power, they can be expanded using the following expansion formulas.

$(a + b)^0 = 1$

$(a + b)^1 = a + b$
$(a + b)^2 = a^2 + 2ab + b^2$
$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$
$(a + b)^4 = a^4 + 4a^3b + 6a^2b^2 + 4ab^3 + b^4$

Step 2: In this case, the binomial is raised to the third power, so we will use this formulae:

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

Step 3: We will insert our values into the formula:
$(x)^3 + 3(x)^2(2y) + 3(x)(2y)^2 + (2y)^3$

Answer: $x^3 + 6x^2y + 12xy^2 + 8y^3$

5. Step 1: Binomial expressions contain two terms.
The first terms is seen as a^n and the last term is seen as b^n.
When binomial expressions are raised to a power, they can be expanded using the following expansion formulas.
$(a + b)^0 = 1$
$(a + b)^1 = a + b$
$(a + b)^2 = a^2 + 2ab + b^2$
$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$
$(a + b)^4 = a^4 + 4a^3b + 6a^2b^2 + 4ab^3 + b^4$
Step 2: In this case, the binomial is raised to the first power, so we will use this formulae:
$(a + b)^1 = a + b$

Step 3: We will insert our values into the formula:
$(15x + 14y)^1$

Answer: 15x + 14y