MATHEMATICS WORKSHEET OF CLASS VIII

TOPIC: ALGEBRAIC EXPRESSIONS

1. **Classify the following expressions as monomials, binomials and trinomials.**

   $4a^2$ _____ $5a^2b+3$ _____

   $7b^3$ _____ $8a^2+7ab+b^2$ _____

   $4x^2+1$ _____ a^2+b^2 _____

2. **Write the degrees of the following polynomials.**

   a) $2x^2+3xy+5y^2+2$ _____ b) $7x^2y+3xy^2+4xy$ _____

   c) $x^3y^3-4x^2y+5xy^2+x^2y^2$ _____ d) $4x^5+5x^3+7x^2+2$ _____

3. **Add.**

   a) $(10x^2+5x-3)+(7x^2-2x+7)=$

   b) $(3x^2y+4x^2y^2-7xy^2)+(9x^2y-x^2y^2+3xy^2)=$

   c) $(10x^2y-3xy^2+5x^2y^2+22)+(3x^2y^2+7)=$

4. **Subtract** $2x^2+5x-7$ **from** $7x^2-5x+3$.

5. **Subtract** $2ab+7a^2+8b^2$ **from** $10b^2+7ab+a^2$.

1. **Write the degrees of the following polynomials.**

   a) $4xy+2x^2y+3y^2+5x^2y^2$ _____ b) $4xy+3$ _____

   c) $7x+2$ _____ d) $32+22xy+3x^2+7y^2+x^2y^2$ _____

2. **Tick the pairs of like terms.**

   a) $3a^2b,\ -5ba^2$ ☐ b) $7abc,\ 8ab$ ☐

   c) $15xy,-7yz$ ☐ d) $5a^2b^2c,\ 12b^2ca^2$ ☐

3. **Add the following.**

   a) $3a^2+4ab-b^2,\ 7b^2-4ab+2a^2,\ a^2+b^2$

   b) $5xy-7x^2-3y^2+4x^2y,\ 5x^2y-xy+x^2+y^2$

   c) $5a^3-2b^3+3a^2b+7ab^2,\ 3a^2b-5ab^2,\ a^3+b^3-a^2b$

4. **Subtract** $3x^2-4y^2$ **from the sum of** x^2+y^2-2xy **and** $3x^2-4xy+7y^2$.

5. **Subtract** $4a^3-3a^2b+ab^2-b^3$ **from** $a^3+b^3-3a^2b+7ab^2$.

1. **Add** $x^3-5x^2+7x+2,\ 15x^2+10x-7$ **and** $x^3-13x+2$.

2. **Add** $3x^2y+4x^3y-xy^2+x^2y^2,\ 11x^2y-x^3y+5x^2y^2$ **and** $5x^3y-x^2y^2+7x^2y-3xy^2$.

3. **Subtract** $5a^3-2a^2+7$ **from the sum of** a^3-3a^2+5a+1 **and** $7a^2+a+3$.

4. **What should be added to** x^4+2x^2-7 **to obtain** $4x^4-3x^3+x^2+2$**?**

5. **What must be subtracted from** $4x^2y^2+3xy+3xy^2$ **to obtain** $8xy^2-4x^2y+7x^2y^2+10xy$?

1. **Find the products of the following expressions.**

   a) $(3x^2y)\times\left(\frac{-1}{5}xyz\right)\left(\frac{3}{5}y^2z\right)=$

   b) $\left(\frac{1}{8}ab\right)\times\left(\frac{-8}{11}bc\right)\times\left(\frac{-22}{3}ca\right)=$

   c) $\left(\frac{3}{8}x^2y\right)\times\left(\frac{-4}{7}y^2z\right)\times\left(\frac{-7}{11}z^2x\right)=$

   d) $\left(\frac{1}{5}ab\right)\times\left(\frac{-3}{5}a^2b\right)\times\left(\frac{5}{22}b^2c\right)=$

2. **Find the volume of the box whose dimensions are** $3xy^2$, $\frac{1}{7}x^3$ **and** $\frac{4}{5}x^2y$.

3. **Find the area of a field whose length is** $3x^2y+y^2$ **and breadth is** $\frac{5}{8}x^2$.

Find the products of the following expressions.

1. **$(2x - 1)\ (x + 2)$ =**

2. $(p^2+q^2)(p+q)$ =

3. $\left(\frac{2}{3}x+y\right)$**$(x^2 - y^2)$ =**

4. **$(2x - 1)(x^2 + x + 1)$ =**

5. $(3a+1)\left(\frac{a^3}{5}-a+1\right)$ =

6. $(x+xy)\left(\frac{x^2}{2}+xy+y^2\right)=$

1. **Write the squares of the following binomials.**

   a) $(2x + 5)$

   b) $(3x - 5)$

   c) $\left(x - \frac{1}{x}\right)$

   d) $\left(2x + \frac{3}{y}\right)$

2. **Find the following products using an identity.**

   a) $(2a + b)(2a - b)$ =

   b) $\left(3x + \frac{1}{y}\right)\left(3x - \frac{1}{y}\right)$ =

3. **Evaluate the following by using the formulae for $(a + b)^2$ and $(a - b)^2$.**

   a) $(101)^2$ =

   b) $(99)^2$ =

   c) $(198)^2$ =

1. **Evaluate the following using suitable identities.**

   a) $82^2 - 18^2 =$

   b) $95 \times 105 =$

   c) $196 \times 204 =$

   d) $\frac{65^2 - 20^2}{85} =$

2. **Find the value of** $x^2 + \frac{1}{x^2}$ **if** $x + \frac{1}{x} = 3$.

3. **Find the value of** $x^2 + \frac{1}{x^2}$ **if** $x - \frac{1}{x} = 4$.

4. **If** $x + y = 4$ **and** $xy = 3$, **find the value of** $x^2 + y^2$.

5. **If** $x^2 + \frac{1}{x^2} = 9$, **find the value of** $x^4 + \frac{1}{x^4}$.

1. **Evaluate the following using suitable identities.**

   a) $(196)^2$ =

   b) 52×48 =

   c) $(205)^2$ =

   d) $(108)^2$ =

2. If $x+\frac{1}{x}=5$, find the value of $x^2+\frac{1}{x^2}$ and $x^4+\frac{1}{x^4}$.

3. If $x^2+\frac{1}{x^2}$ = 7 find the value of $x+\frac{1}{x}$, $x > 0$.

4. If $x+y=5$ and $xy=6$. Find the value of $x^2 + y^2$ and $x - y$.

1. **Find the following products:**

   a) $(x + 2)(3x + 1)(x - 3)$ =

   b) $(5x + 1)(2x - 3)(x + 5)$ =

   c) $(2x + y)(x - y)(x + y)$ =

   d) $(3a + b)(2a + b)(a - b)$ =

2. **Factorise the following using suitable identities.**

   a) $49x^2 - 9^2$ =

   b) $16x^2 - 25$ =

   c) $x^2 - 2x + 1$ =

   d) $9x^2 - 6x + 1$ =

   e) $x^2 - (y + z)^2$ =