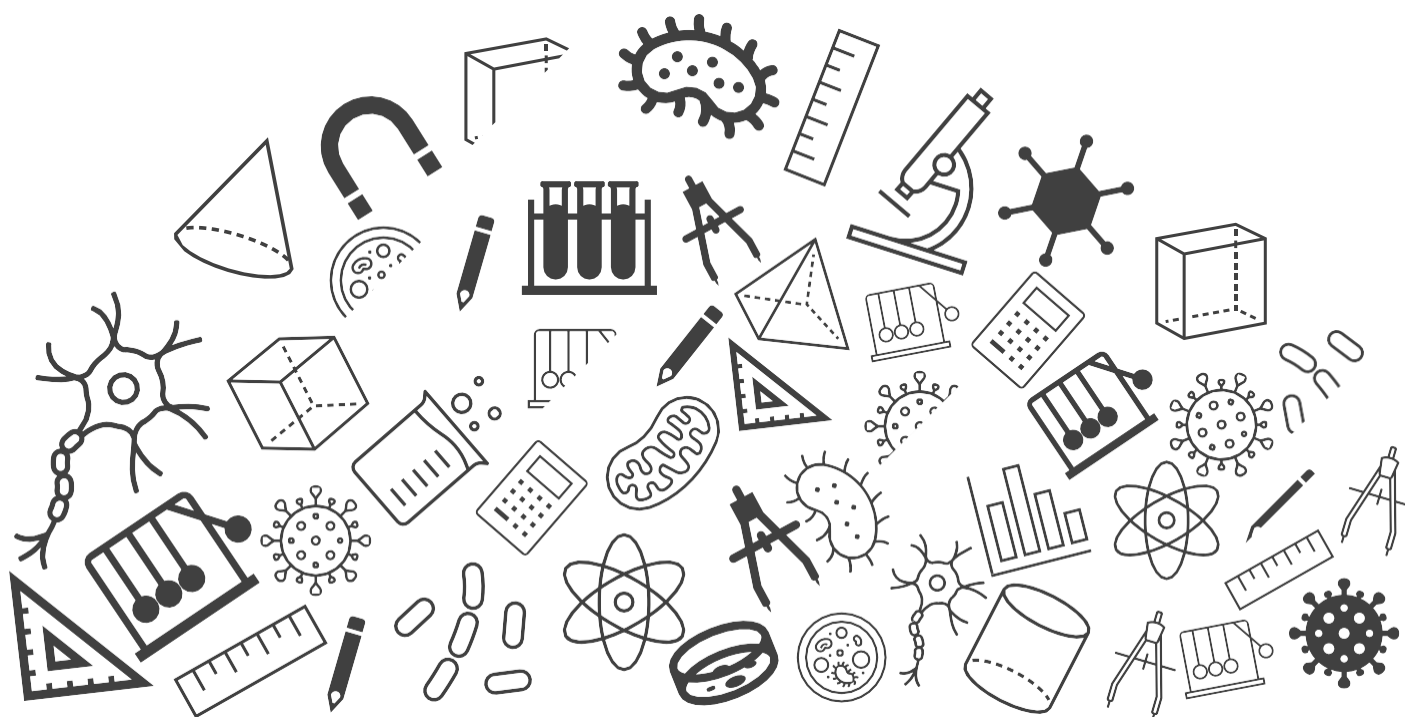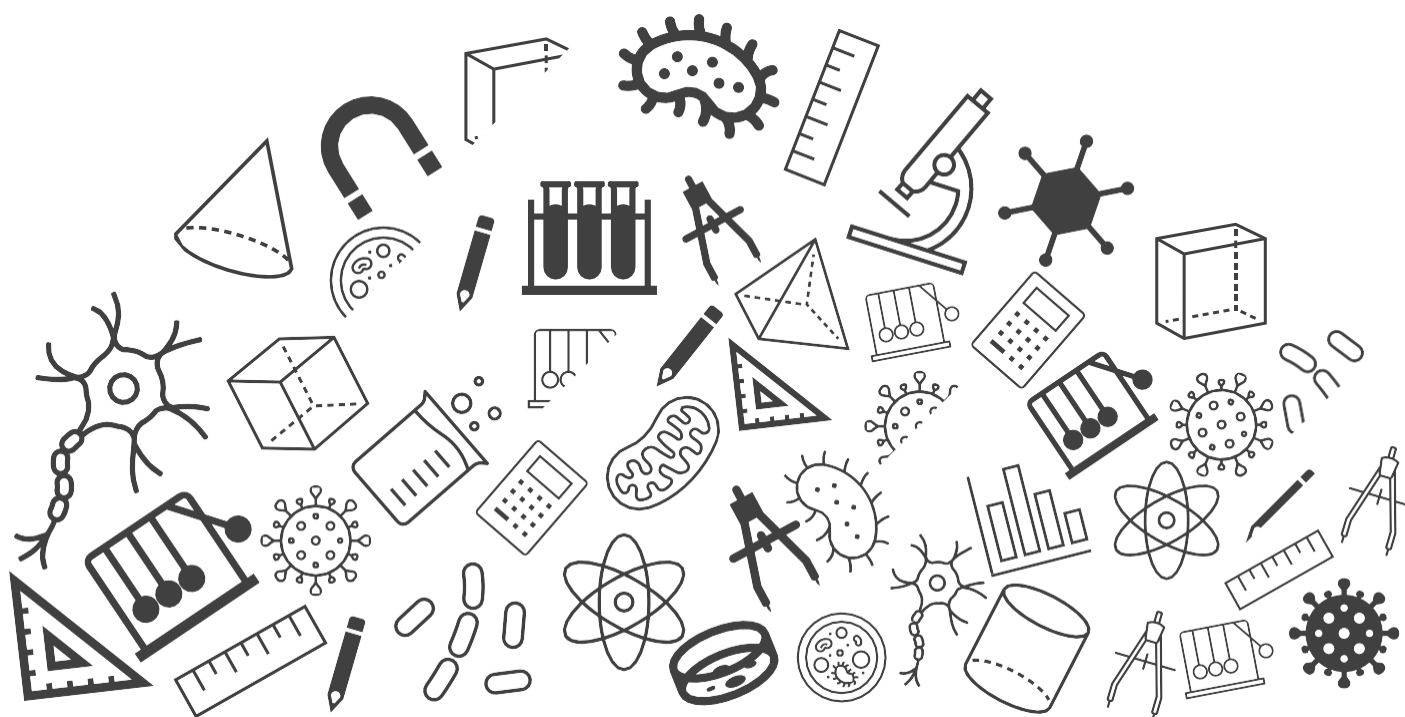# BYJU'S

# Grade 08: Maths
# Exam Important Questions

# Algebraic Expressions
# and Identities

# Algebraic Expressions and Identities

1. Classify the given expressions based on the number of terms they have.

| | |
|---|---|
| $2y - 3y^2 + 4y^3$ | |
| $1000$ | |
| $4z - 15z^2$ | |
| $7 + y + 5x$ | |

[2 marks]

Solution:

| | |
|---|---|
| $2y - 3y^2 + 4y^3$ | Trinomial |
| $1000$ | Monomial |
| $4z - 15z^2$ | Binomial |
| $7 + y + 5x$ | Trinomial |

[2 marks]

2. Find the like terms from the following:

$7x, 14x, -13x, 5x^2, 7y, 7xy, -9y^2, -9x^2, and -5yx$

[1 mark]

Like terms from these are:
(i) $7x, 14x, -13x$ are like terms.
(ii) $5x^2$ and $-9x^2$ are like terms.
(iii) $7xy \ and -5yx$ are like terms.

[1 mark]

3. Subtract $5a^2 - 7ab + 5b^2$ from $3ab - 2a^2 - 2b^2$   [2 marks]

$3ab - 2a^2 - 2b^2 - (5a^2 - 7ab + 5b^2)$

$= 3ab - 2a^2 - 2b^2 - 5a^2 + 7ab - 5b^2$
$= 3ab + 7ab - 2a^2 - 5a^2 - 2b^2 - 5b^2$
$= 10ab - 7a^2 - 7b^2$
$= -7a^2 - 7b^2 + 10ab$  (2 marks)

4. The perimeter of a triangle is $6p^2 - 4p + 9$ and two of its sides are $p^2 - 2p + 1$ and $3p^2 - 5p + 3$. Find the third side of the triangle.

[4 marks]

Solution:
Given: Perimeter of a triangle $= 6p^2 - 4p + 9$
Lengths of its two sides: $p^2 - 2p + 1$ and $3p^2 - 5p + 3$

Sum of the lengths of the given sides
$= (p^2 - 2p + 1) + (3p^2 - 5p + 3) = (p^2 + 3p^2) + [(-2p) + (-5p)] + (1 + 3)$

$= 4p^2 - 7p + 4$
[2 marks]
Now,
Length of the third side = Perimeter − Sum of the length of its two sides
$= 6p^2 - 4p + 9 - (4p^2 - 7p + 4)$
$\qquad = 6p^2 - 4p + 9 - 4p^2 + 7p - 4$
$\qquad = (6p^2 - 4p^2) + (-4p + 7p) + (9 - 4)$
$\qquad = 2p^2 + 3p + 5$

Therefore, length of the third side is $2p^2 + 3p + 5$.
[2 marks]

5. The cost of a chocolate is ₹$(x+4)$ and Rohit bought ₹$(x+4)$ chocolates. Find the total amount paid by him in terms of $x$. If $x = 10$, find the amount paid by him.

[2 marks]

Solution:
Given,
Cost of 1 chocolate = $(x+4)$
No. of chocolates bought = $(x+4)$

**Step 1:** Finding amount paid in terms of $x$
We know that, total amount = Cost of one chocolate × Number of chocolates
$$= (x+4)(x+4)$$
$$= (x+4)^2$$
$$= x^2 + 8x + 16 \qquad [\because (a+b)^2 = a^2 + b^2 + 2ab]$$
Amount paid by Rohit = $(x^2 + 8x + 16)$
[1 mark]
**Step 2:** Finding actual amount paid, when $x = 10$
Given, $x = 10$
$\therefore$ Total amount = $10^2 + 8 \times 10 + 16$
$= $ ₹196
Hence, amount paid by Rohit is ₹196.
[1 mark]

6. The height of a triangle is $x^4 + y^4$ and its base is $14xy$. Find the area of the triangle.
[1 mark]

Area of triangle = $\frac{1}{2} \times$ base $\times$ height
[0.5 mark]
Given,
Height = $x^4 + y^4$
Base = $14xy$
$\therefore$ Required area = $\frac{1}{2} \times (x^4 + y^4) \times 14xy$
$$= 7xy(x^4 + y^4)$$

[0.5 mark]

# Algebraic Expressions and Identities

7. Simplify the expression: $(x^2 - 5)(x + 5) + 25$

   [2 marks]

   $(x^2 - 5)(x + 5) + 25$
   $= x^2(x + 5) - 5(x + 5) + 25$
   [0.5 marks]

   $= x^2 \times x + x^2 \times 5 - 5 \times x - 5 \times 5 + 25$
   [0.5 marks]

   $= x^3 + 5x^2 - 5x - 25 + 25$
   [0.5 marks]

   $= x^3 + 5x^2 - 5x$
   [0.5 marks]

8. Simplify $(a + b)(2a - 3b + c) - (2a - 3b)c$.

   [3 marks]

   **Solution:**
   Solving the first expression:
   $(a + b) \times (2a - 3b + c)$
   $a \times (2a - 3b + c) + b \times (2a - 3b + c)$
   $2a^2 - 3ab + ac + 2ab - 3b^2 + bc$
   $2a^2 - 3b^2 - ab + ac + bc$ -----(i)
   [1 mark]

   Solving the second expression:
   $-(2a - 3b) \times c$
   $-2ac + 3bc$ -----(ii)
   [1 mark]

   Adding (i) and (ii),
   $2a^2 - 3b^2 - ab + ac + bc - 2ac + 3bc$
   $= 2a^2 - 3b^2 - ab - ac + 4bc$
   [1 mark]