

PRE MID PRACTICE QUESTIONS

1. Ravi's garden has dimensions $(a + b)$ metres by $(a - b)$ metres. If he reduces both the length and width by 1 metre, what will the new area be?

- (a) $(a^2 - b^2 - 2a - 2b + 1) \text{ m}^2$ (b) $(a^2 - b^2 - 2a - 2b - 1) \text{ m}^2$
 (c) $(a^2 - b^2 - 2a - 2b) \text{ m}^2$ (d) $(a^2 - b^2 - 2a + 2b) \text{ m}^2$

2. What is the value of $(a + b)^2 - (a - b)^2$?

- (a) $4ab$ (b) $4a^2 + 4b^2$ (c) $2a^2 - 2b^2$ (d) $4a^2 - 4b^2$

3. If $49x^2 - y = (7x + \frac{1}{2})(7x - \frac{1}{2})$, then what is the value of y ?

- (a) 0 (b) $\frac{1}{4}$ (c) $\frac{1}{2}$ (d) 1

4. The value of $249^2 - 248^2$ is

- (a) 12 (b) 477 (c) 487 (d) 497

5. The factorisation of $4x^2 + 8x + 3$ is

- (a) $(x + 1)(x + 3)$ (b) $(2x + 1)(2x + 3)$ (c) $(x + 2)(2x + 5)$ (d) $(2x - 1)(2x - 3)$

Select the correct answer from the options (a), (b), (c), and (d) given below.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).

(c) Assertion (A) is true, but Reason (R) is false.

(d) Assertion (A) is false, but Reason (R) is true.

6. **Assertion (A):** The expansion of $(a + b)^3$ is $a^3 + b^3 + 3ab(a + b)$.

Reason (R): This is the correct factorisation of the sum of cubes.

7. **Assertion (A):** The identity $(a + b)^2 - (a - b)^2 = 4ab$ holds true for all values of a and b .

Reason (R): This is an application of the difference of squares identity.

8. Factorise: $4x^2 + 20x + 25$.

9. Use suitable identity to find the product of $(y^2 - \frac{3}{2})(y^2 - \frac{3}{2})$.

10. A rectangular pool has area $(2x^2 + 7x + 3)$ square ft. If its width is $(2x + 1)$ ft, find its length.

11. Factorise: $9a^2 - 9b^2 + 6a + 1$

12. Find the product: $(x - 3y)(x + 3y)(x^2 + 9y^2)$

13. If $x + y = 12$ and $xy = 27$, find the value of $x^3 + y^3$.

14. Factorise: $8P^3 + \frac{12}{5}P^2 + \frac{6}{25}P + \frac{1}{125}$

15. If $p(x) = x^2 - 2\sqrt{2} + 1$, then find $p(2\sqrt{2})$.

16. A group of $(a + b)$ teachers, $(a^2 + b^2)$ girls and $(a^3 + b^3)$ boys set out for an 'Adult Education Mission'. If there are 10 teachers and 58 girls in the group, find the number of boys.

17. Ravita donated ₹ $(x^3 + \frac{1}{x^3})$ to a blind school. Her friends wanted to know the amount donated by her. She did not disclose the amount but gave a hint that $x + \frac{1}{x} = ₹ 7$. Find the amount donated by Ravita to blind school.

18. A municipal corporation is redesigning a square-shaped city park that currently measures $100\text{ m} \times 100\text{ m}$. To improve functionality, they decide to expand the park by adding 5 m to both the length and the width, making it a larger square. Later, to build a footpath around it, they take 2 m off the length and 2 m off the width of this expanded park, making it $(105 - 2) \times (105 - 2)$.

Using this information, answer the following questions:



(i) Which algebraic identity is most useful to calculate the area of the initially expanded park ($105\text{ m} \times 105\text{ m}$)?

(ii) What is the exact area of the expanded park ($105\text{ m} \times 105\text{ m}$) using identities?

(iii) If the park dimensions become $(105 - 2) \times (105 - 2)$, find its area using suitable identity.