

# Boost Free Lessons - Year 10 Maths

## Lesson 3: Factorising Expressions

Name: \_\_\_\_\_ Grade: \_\_\_\_\_ Date: \_\_\_\_\_

### Worked Example 1

**Factorise  $x^2 - 49$**

1. Both terms are perfect squares and there is a minus sign between them, so this is a **difference of two squares**.
2. The rule is  $a^2 - b^2 = (a + b)(a - b)$ .
3. Here  $a^2 = x^2$  so  $a = x$ , and  $b^2 = 49$  so  $b = 7$ .
4. Note that  $x^2 + 49$  cannot be factorised, because the rule needs a minus.

$$= (x + 7)(x - 7)$$

### Worked Example 2

**Factorise  $3x^2 + 15x + 18$**

1. Always take out the highest common factor first. Every term divides by 3.
2. That gives  $3(x^2 + 5x + 6)$ .
3. Now factorise the trinomial inside: two numbers that multiply to 6 and add to 5 are 2 and 3.
4. Keep the 3 out the front in your final answer.

$$= 3(x + 2)(x + 3)$$

**Remember:** Work in this order: take out any common factor, then check for a difference of two squares, then try the trinomial method. Check every answer by expanding.



**Question 1:** Factorise the following using the difference of two squares.

1.  $x^2 - 9$

2.  $x^2 - 25$

3.  $x^2 - 100$

4.  $4x^2 - 9$

5.  $x^2 - 144$

6.  $9x^2 - 16$

7.  $x^2 - 1$

8.  $25x^2 - 4$

9.  $x^2 - 81$

10.  $16x^2 - 49$



**Question 2:** Factorise the following completely.

1.  $x^2 + 6x + 8$

2.  $x^2 - 8x + 15$

3.  $2x^2 + 10x$

4.  $3x^2 - 27$

5.  $x^2 + x - 20$

6.  $5x^2 + 20x + 15$

7.  $x^2 - 2x - 24$

8.  $2x^2 - 18$



**Question 3:** Answer the following questions.

1. Factorise  $x^2 - 36$ .
  
  
  
  
  
  
  
  
  
  
2. Factorise  $4x^2 + 12x + 8$ .
  
  
  
  
  
  
  
  
  
  
3. A square has area  $x^2 - 10x + 25$ . Write an expression for its side length.
  
  
  
  
  
  
  
  
  
  
4. Factorise  $x^3 - 4x$ .
  
  
  
  
  
  
  
  
  
  
5. Factorise  $3x^2 - 12x - 15$ , then check by expanding.





Every student has gaps. The hard part is knowing exactly where they are.  
That is what a Boost assessment is for.

## Book a Free Assessment

Normally valued at \$199, free for new families

- A friendly skills check aligned to the NSW syllabus
- Face to face with our qualified tutors
- A clear picture of your child's strengths and gaps
- A weekly plan built around what they actually need

**Book a Free Assessment →**

**[boosttutoring.com.au/contact](https://boosttutoring.com.au/contact)**



**Answers:** Factorising Expressions**Question 1**

1.  $(x + 3)(x - 3)$
2.  $(x + 5)(x - 5)$
3.  $(x + 10)(x - 10)$
4.  $(2x + 3)(2x - 3)$
5.  $(x + 12)(x - 12)$
6.  $(3x + 4)(3x - 4)$
7.  $(x + 1)(x - 1)$
8.  $(5x + 2)(5x - 2)$
9.  $(x + 9)(x - 9)$
10.  $(4x + 7)(4x - 7)$

**Question 2**

1.  $(x + 2)(x + 4)$
2.  $(x - 3)(x - 5)$
3.  $2x(x + 5)$
4.  $3(x + 3)(x - 3)$
5.  $(x + 5)(x - 4)$
6.  $5(x + 1)(x + 3)$
7.  $(x - 6)(x + 4)$
8.  $2(x + 3)(x - 3)$

**Question 3**

1.  $(x + 6)(x - 6)$
2.  $4(x + 1)(x + 2)$
3.  $x - 5$
4.  $x(x + 2)(x - 2)$
5.  $3(x - 5)(x + 1)$ , and expanding gives  $3x^2 - 12x - 15$  (correct)

