Factor ax² + bx + c, Part 1

QE08-V1 · storyboard · QE08 Factor ax² + bx + c. Read each picture with its sentences.

Picture 1

Factor $2y^2 - 3y - 35.$

$(2y + B)(y + D), \quad BD = -35$ $2y^2 = 2y \cdot y$

$2D + B = -3$ **the cross products**

$B = 7,\ D = -5: \quad 2(-5) + 7 = -3$ **try the pairs, both orders**

$\boxed{(2y + 7)(y - 5)}$

Check: $-10y + 7y = -3y$ ✓

1. Factor 2 y squared, minus 3 y, minus 35.
2. 2 y squared is 2 y times y, so the brackets start 2 y and y.
3. The numbers B and D multiply to negative 35.
4. The middle term comes from the cross products: 2 y times D, plus B times y.
5. So 2 D plus B must be negative 3.
6. Now try the pairs that multiply to negative 35, in both orders.
7. B equals 7 and D equals negative 5 works: 2 times negative 5, plus 7, is negative 3.
8. So the answer is 2 y plus 7, times y minus 5.
9. Check the middle term: negative 10 y plus 7 y is negative 3 y.

Picture 2

Solve $2y^2 - 3y - 35 = 0.$

$$2y + 7 = 0 \quad \text{or} \quad y - 5 = 0$$

$$\boxed{y = -\frac{7}{2} \quad \text{or} \quad y = 5} \qquad 2y = -7$$

10. Now solve 2 y squared, minus 3 y, minus 35, equals 0.
11. Each factor could be 0.
12. 2 y equals negative 7, so y is negative 7 over 2.
13. Or y equals 5.

Picture 3

Trap $2y^2 - 3y - 35$

$\times$ $(2y - 5)(y + 7)$

✓ $(2y + 7)(y - 5)$

14. Watch for the trap: the order matters.
15. 2 y minus 5, times y plus 7, gives a middle term of 14 y minus 5 y, which is 9 y.
16. Swap the numbers to get negative 3 y.

Picture 4

Trap $2y + 7 = 0$

$\times \; y = -7$

$\checkmark \quad y = -\frac{7}{2}$

17. Another trap: 2 y plus 7 equals 0 does not give negative 7.
18. Take 7 away, then divide by 2: y equals negative 7 over 2.