

# Answers: Factorization

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## Summary

Answers to questions relating to the guide on factorization.

*These are the answers to [Questions: Factorization](#).*

**Please attempt the questions before reading these answers!**

## Q1

Note that you can rearrange the factorized brackets — the answer stays the same because the order of multiplication doesn't matter.

1.1.  $7x + 35 = 7(x + 5)$ .

1.2.  $3x - 51 = 3(x - 17)$ .

1.3.  $6m + 3n = 3(2m + n)$ .

1.4.  $5f + 10 + 15k = 5(f + 2 + 3k)$ .

1.5.  $10x - 2 + 3y^2 + 3y = 2(5x - 1) + y(3y + 3)$ .

1.6.  $9xy - 3x = 3x(3y - 1)$ .

1.7.  $a^2 + ab = a(a + b)$ .

1.8.  $4m^2 - 8nm + 12m = 4m(m - 2n + 3)$ .

1.9.  $12wx^2 + 16wx = 4wx(3x + 4)$ .

1.10.  $a^3b + ab^2 + ab^3 = ab(a^2 + b(1 + b))$ .

1.11.  $x(x - 6) + 3(6 - x) = (x - 6)(x - 3)$ .

1.12.  $3w + 3z + xw + xz = (w + z)(3 + x)$ .

1.13.  $2ab + b^2 - b - 2a = (2a + b)(b - 1)$ .

1.14.  $a^2b + 3a^2 + ab + 3a - 2b - 6 = (b + 3)(a - 1)(a + 2)$ .

## Q2

Note that you can rearrange the factorized brackets — the answer stays the same because the order of multiplication doesn't matter.

- 2.1.  $x^2 + 6x + 5 = (x + 5)(x + 1)$ .
- 2.2.  $x^2 - 3x - 4 = (x - 4)(x + 1)$ .
- 2.3.  $x^2 - 4x + 3 = (x - 3)(x - 1)$ .
- 2.4.  $2x^2 - 13x + 21 = (2x - 7)(x - 3)$ .
- 2.5.  $5x^2 - 10x + 5 = 5(x - 1)(x - 1)$ .
- 2.6.  $x^2 - xy - 6y^2 = (x - 3y)(x + 2y)$ .
- 2.7.  $12x^2y^2 + 8xy^2 - 4y^2 = 4y^2(3x - 1)(x + 1)$ .
- 2.8.  $x^2 - 4yx - x + 4y = (x - 4y)(x - 1)$ .
- 2.9.  $x^2 + y^2 - 2xy = (x - y)^2$  or  $(y - x)^2$ .
- 2.10.  $x^2 - y^2 = (x - y)(x + y)$ .
- 2.11.  $9x^2 + 3x - 2 = (3x - 1)(3x + 2)$ .

### Q3

- 3.1. You worked out in 1.1 that  $7x + 35 = 7(x + 5)$ . Solving for  $x$  gives  $x = -5$ .
- 3.2. You worked out in 1.11 that  $x(x - 6) + 3(6 - x) = (x - 6)(x - 3)$ . Solving for  $x$  gives  $x = 3$  and  $x = 6$ .
- 3.3. You worked out in 2.3 that  $x^2 - 4x + 3 = (x - 3)(x - 1)$ . Solving for  $x$  gives  $x = 3$  and  $x = 1$ .
- 3.4. You worked out in 2.7 that  $12x^2y^2 + 8xy^2 - 4y^2 = 4y^2(3x - 1)(x + 1)$ . Solving for  $x$  gives  $x = 1/3$  and  $x = -1$ .
- 3.5. You worked out in 2.8 that  $x^2 - 4yx - x + 4y = (x - 4y)(x - 1)$ . Solving for  $x$  gives  $x = 4y$  and  $x = 1$ .

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v1.0: initial version created 04/25 by Millie Pike, as part of a University of St Andrews VIP project.

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