

Foundation GCSE: Factorising

Name: _____

Class: _____

Instructions: Answer all questions. Questions are ordered from easiest (1) to hardest (20). Working out should be shown where appropriate.

1. Factorise fully $2x + 4$.
2. Factorise fully $3x - 9$.
3. Factorise fully $5y + 15$.
4. Factorise fully $x^2 + 3x$.
5. Factorise fully $4x^2 - 8x$.
6. Factorise fully $6x + 9xy$.
7. Factorise fully $10ab - 15b^2$.
8. Factorise $x^2 + 7x + 12$.
9. Factorise $x^2 + 5x - 14$.
10. Factorise $x^2 - 9x + 20$.
11. Factorise $x^2 - 25$.
12. Factorise $x^2 - 8x - 20$.
13. Factorise fully $3x^2 + 6x$.
14. Factorise $x^2 - 49$.
15. Factorise $x^2 - 6x + 9$.
16. Factorise fully $2x^2 + 10x + 12$.
17. Factorise $2x^2 + 7x + 3$.
18. Factorise $3x^2 - 10x + 8$.
19. Factorise fully $5x^2 - 20$.
20. Factorise fully $2x^2 - 8x - 24$.

Answers & Worked Solutions

1. $2(x + 2)$
Highest common factor is 2.
2. $3(x - 3)$
Highest common factor is 3.
3. $5(y + 3)$
Highest common factor is 5.
4. $x(x + 3)$
Take out common factor x .
5. $4x(x - 2)$
Highest common factor is $4x$.
6. $3x(2 + 3y)$
Highest common factor is $3x$.
7. $5b(2a - 3b)$
Highest common factor is $5b$.
8. $(x + 3)(x + 4)$
Factors of 12 that add to 7 are 3 and 4.
9. $(x + 7)(x - 2)$
Factors of -14 that add to 5 are 7 and -2 .
10. $(x - 4)(x - 5)$
Factors of 20 that add to -9 are -4 and -5 .
11. $(x - 5)(x + 5)$
Difference of two squares: $x^2 - 5^2$.
12. $(x - 10)(x + 2)$
Factors of -20 that add to -8 are -10 and 2.
13. $3x(x + 2)$
Highest common factor is $3x$.
14. $(x - 7)(x + 7)$
Difference of two squares: $x^2 - 7^2$.
15. $(x - 3)^2$
Perfect square: factors of 9 adding to -6 are -3 and -3 .
16. $2(x + 2)(x + 3)$
Take out 2 first: $2(x^2 + 5x + 6)$, then factorise quadratic.
17. $(2x + 1)(x + 3)$
Split middle term: $2x^2 + 6x + x + 3 = 2x(x + 3) + 1(x + 3)$.
18. $(3x - 4)(x - 2)$
Split middle term: $3x^2 - 6x - 4x + 8 = 3x(x - 2) - 4(x - 2)$.
19. $5(x - 2)(x + 2)$
Take out 5: $5(x^2 - 4)$, then use difference of two squares.
20. $2(x - 6)(x + 2)$
Take out 2: $2(x^2 - 4x - 12)$, then factorise quadratic.