



## "Full Coverage": Factorising

This worksheet is designed to cover one question of each type seen in past papers, for each GCSE Higher Tier topic. This worksheet was automatically generated by the DrFrostMaths Homework Platform: students can practice this set of questions interactively by going to [www.drfrostmaths.com/homework](http://www.drfrostmaths.com/homework), logging on, *Practise* → *Past Papers/Worksheets* (or *Library* → *Past/Past Papers* for teachers), and using the 'Revision' tab.

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### Question 1

**Categorisation: Factorise out an integer.**

[Edexcel GCSE June2016-2H Q2b] Factorise  $3y + 6$

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### Question 2

**Categorisation: Factorise out a single variable.**

[Edexcel IGCSE May2014-3H Q4c] Factorise  $f^2 - 2f$

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### Question 3

**Categorisation: Factorise out multiple variables.**

[Edexcel GCSE Nov2010-3H Q16d] Factorise fully  $x^2y + xy^2$

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### Question 4

**Categorisation: Factorise out a mixture of variables and integers.**

[Edexcel GCSE June2007-3I Q15d, June2007-5H Q21b]

Factorise completely  $12xy + 4x^2$

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### Question 5

**Categorisation: Use laws of indices to factorise out a common term involving larger powers.**

[Edexcel IGCSE May2015-4H Q7e] Factorise fully  $20e^5f^2 - 16e^2f$

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### Question 6

**Categorisation: Factorise out an entire bracket.**

*[Edexcel IGCSE Jan2014-4H Q13]*

Factorise fully  $4(x - 5)^2 + 3(x - 5)$

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### Question 7

**Categorisation: As above.**

*[Edexcel GCSE(9-1) Mock Set 2 Spring 2017 1H Q17a]*

Factorise  $3(x - y)^2 - 2(x - y)$

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### Question 8

**Categorisation: Factorise quadratics where the coefficient of the squared term is 1.**

*[Edexcel IGCSE Jan2015-4H Q12c]*

Factorise

$$x^2 + x - 30$$

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### Question 9

**Categorisation: As above, but with a different mixture of signs.**

*[Edexcel GCSE March2012-3H Q15b]*

Factorise  $p^2 - 6p + 8$

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### Question 10

**Categorisation: Factorise quadratics involving algebraic coefficients.**

[Edexcel GCSE Nov2011-4H Q23a] Factorise  $x^2 + px + qx + pq$

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### Question 11

**Categorisation: Factorise quadratics where the coefficient of the squared term  $\neq 1$ .**

[Edexcel GCSE June2013-2H Q19c]

Factorise  $2p^2 - p - 10$

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### Question 12

**Categorisation: Factorise quadratic-like expressions involving a mixture of variables.**

[Edexcel IGCSE May2015-3H Q9c]

Factorise  $6p^2 - 5pq - 6q^2$

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### Question 13

**Categorisation: Factorise the difference of two squares.**

[Edexcel IGCSE June2011-4H Q15b]

Factorise  $a^2 - 144$

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### Question 14

**Categorisation: As above, but involving terms of the form  $ax^2$ .**

[Edexcel GCSE Nov2013-2H Q21a]

Factorise  $4x^2 - 9$

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### Question 15

**Categorisation:** Factorise the difference of two squares where a common term must be factorised out first.

*[Edexcel IGCSE Jan2016-4H Q17b]*

Factorise fully  $2y^2 - 72$

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### Question 16

**Categorisation:** The reverse: factorise the difference of two squares, followed by factorising out a common term (possibly an entire bracket). (Or alternatively, expand out and refactorise using a mixture of factorization techniques)

*[Edexcel GCSE June2006-5H Q23bi]*

Factorise fully  $(n^2 - a^2) - (n - a)^2$

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### Question 17

**Categorisation:** Factorise a difference of two squares involving squared brackets, followed by subsequent factorisation of common factors.

*[Edexcel IGCSE Jan2014-3H Q19]*

Factorise completely  $(12x - y)^2 - (4x - 3y)^2$

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### Question 18

**Categorisation:** Understand how the difference of two squares can be used in the context of factorisation of integers.

*[Edexcel IGCSE May2015-3H Q14b]*

$$N = 2^{22} - 1$$

Write  $N$  as the product of two integers, both of which are greater than 1000.

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## Answers

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### Question 1

$$3(y + 2)$$

### Question 2

$$f(f - 2)$$

### Question 3

$$xy(x + y)$$

### Question 4

$$4x(3y + x)$$

### Question 5

$$4e^2f(5e^3f - 4)$$

### Question 6

$$(x - 5)(4x - 17)$$

### Question 7

$$(x - y)(3x - 3y - 2)$$

### Question 8

$$(x - 5)(x + 6)$$

### Question 9

$$(p - 4)(p - 2)$$

### Question 10

$$(x + p)(x + q)$$

### Question 11

$$(2p - 5)(p + 2)$$

### Question 12

$$(3p + 2q)(2p - 3q)$$

### Question 13

$$(a - 12)(a + 12)$$

### Question 14

$$(2x - 3)(2x + 3)$$

### Question 15

$$2(y + 6)(y - 6)$$

### Question 16

$$2a(n - a)$$

### Question 17

$$8(4x - y)(4x + y)$$

### Question 18

$$2047 \text{ and } 2049$$