

# Factoring Polynomials: math practice, Grade 9 – download the PDF

22 problems graded by difficulty (★ easy, ★★ medium, ★★★ hard). Try first, without looking at the solutions!

## 1 Finding the GCF

★ ★ ★

Find the greatest common factor of  $12a^2b$  and  $18ab^3$ .

## 2 Factoring out a GCF

★ ★ ★

Factor each polynomial: a)  $15x + 25$  b)  $8y^2 - 12y$  c)  $9m^3 + 6m^2$ .

## 3 Easy trinomials

★ ★ ★

Factor: a)  $x^2 + 7x + 10$  b)  $x^2 + 10x + 21$  c)  $x^2 + 11x + 24$ .

## 4 Trinomials with negative terms

★ ★ ★

Factor: a)  $x^2 - x - 12$  b)  $x^2 + 2x - 15$  c)  $x^2 - 9x + 14$ .

## 5 Differences of squares



Factor: a)  $x^2 - 81$  b)  $4y^2 - 25$  c)  $100 - n^2$ .

## 6 Reading factored equations



Solve: a)  $(x - 4)(x + 9) = 0$  b)  $x(2x - 7) = 0$  c)  $(3x + 6)(x - 1) = 0$ .

## 7 True or false?



Decide whether each statement is true or false and justify. a)  $x^2 + 16 = (x + 4)(x - 4)$  b)  $6x + 9 = 3(2x + 3)$  c)  $x^2 + 10x + 25 = (x + 5)^2$ .

## 8 Factor completely



Factor  $12x^3 - 18x^2 + 30x$  completely.

## 9 Grouping practice



Factor by grouping: a)  $x^3 + 5x^2 + 2x + 10$  b)  $3ab + 6a - 4b - 8$ .

## 10 Larger constants



Factor: a)  $x^2 - 3x - 54$  b)  $x^2 + x - 56$ .

## 11 The ac method



Factor: a)  $2x^2 + 7x + 3$  b)  $5x^2 - 17x + 6$ .

## 12 GCF and squares together



Factor completely: a)  $9x^2 - 49$  b)  $50x^2 - 2$ .

## 13 Perfect square trinomials



Factor: a)  $x^2 - 12x + 36$  b)  $49x^2 + 28x + 4$  c)  $9y^2 - 24y + 16$ .

## 14 First equations

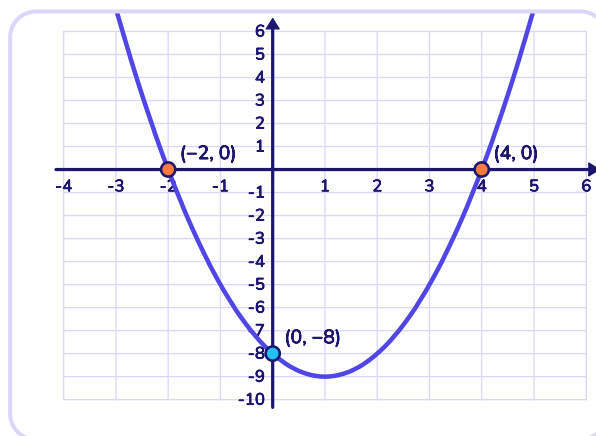


Solve by factoring: a)  $x^2 - 8x + 15 = 0$  b)  $x^2 + 3x = 28$ .

## 15 Reading a graph



The graph shows  $y = x^2 - 2x - 8$ .



a) Read the x-intercepts. b) Factor  $x^2 - 2x - 8$  and confirm. c) Where is the y-intercept?

## 16 Garden dimensions



A rectangular garden has area  $(x^2 + 9x + 14)$  square meters. a) Factor the area to find expressions for the length and the width. b) If  $x = 3$ , find the perimeter.

**17 A trinomial equation**

★★★

Solve  $6x^2 + x - 2 = 0$ .

**18 Squares and common factors**

★★★

Solve: a)  $4x^2 = 25$  b)  $3x^2 = 12x$ .

**19 Consecutive integers**

★★★

The product of two consecutive positive integers is 156. Find them.

**20 A launched ball**

★★★

A ball thrown upward from a platform has height  $h = -16t^2 + 64t + 80$  feet after  $t$  seconds. When does it hit the ground ( $h = 0$ )?

**21 Find the error**

★★★

A student solves  $(x - 2)(x + 3) = 14$  by writing  $x - 2 = 14$  or  $x + 3 = 14$ . Explain the mistake and solve correctly.

**22 Which values of k?**

★★★

Find every integer  $k$  for which  $x^2 + kx + 12$  can be factored into two binomials with integer coefficients.



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