

# Algebra 1 - Factoring Polynomials - Test Answer Key

Common Core A-SSE.A.2, A-SSE.B.3a, A-APR.B.3 · [maths-pdf.fr/en/](https://maths-pdf.fr/en/)

Grade the factoring test with this key. Every question lists the points available and how to split them between method and result. Students who show clear work should receive partial credit, even if the final answer is not correct. The test totals 20 points in all.

**Algebra 1** · Common Core State Standards: **A-SSE.A.2, A-SSE.B.3a, A-APR.B.3**

## Question 1 - Greatest common factor [2 pts]

The GCF is  $8x^2$ :  $\frac{24x^3}{8x^2} = 3x$  and  $\frac{16x^2}{8x^2} = 2$ .

$$8x^2(3x+2)$$

*Scoring: 1 point for the GCF; 1 point for the remaining factor.*

## Question 2 - Simple trinomial [2 pts]

|   | x     | 8    |
|---|-------|------|
| x | $x^2$ | $8x$ |
| 3 | $3x$  | 24   |

Cells  $8x$  and  $3x$  add to  $11x$ .

Numbers with product 24 and sum 11: 3 and 8.

$$(x+3)(x+8)$$

*Scoring: 1 point for the pair 3 and 8; 1 point for the factors.*

## Question 3 - Mixed signs [2 pts]

Product  $-32$  and sum  $-4$ :  $-8$  and  $4$ .

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

Scoring: 1 point for the pair; 1 point for the factors.

#### Question 4 - Leading coefficient 3 [2 pts]

Multiply  $3 \cdot (-6) = -18$ . The numbers 9 and  $-2$  add to 7.

Split:  $3x^2 + 9x - 2x - 6 = 3x(x+3) - 2(x+3)$ .

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

Scoring: 1 point for splitting the middle term; 1 point for the factors.

#### Question 5 - Difference of squares [2 pts]

$$x^2 - 9^2 = (x-9)(x+9).$$

$$(x-9)(x+9)$$

Scoring: 1 point for recognizing the pattern; 1 point for the factors.

#### Question 6 - Perfect square trinomial [2 pts]

$49 = 7^2$  and  $2(7) = 14$ , so it is a perfect square.

$$(x-7)^2$$

Scoring: 1 point for the pattern; 1 point for the factored form.

#### Question 7 - Factor completely and find zeros [3 pts]

a) Factor out 3:  $3(x^2 - 16)$ . Then  $x^2 - 16 = (x-4)(x+4)$ .

b) Set  $x-4 = 0$  or  $x+4 = 0$ .

$$3(x-4)(x+4); x = 4 \text{ or } x = -4$$

Scoring: part a, 1 point for the GCF and 1 point for the difference of squares; part b, 1 point.

#### Question 8 - Rectangle dimensions [3 pts]

$$\begin{array}{c}
 x + 8 \\
 \boxed{A = x^2 + 10x + 16} \\
 x + 2
 \end{array}$$

Length  $x+8$ .

a) Product 16 and sum 10: 2 and 8, so  $x^2+10x+16=(x+2)(x+8)$ .

b) The width is  $x+2$ , so the length is  $x+8$ .

$(x+2)(x+8)$ ; **length  $x+8$  m**

*Scoring: part a, 1 point for the pair and 1 point for the factors; part b, 1 point.*

### Question 9 - Ball landing time [2 pts]

Factor out  $-16t$ :  $h(t) = -16t(t-3)$ .

The height is 0 when  $t=0$  or  $t=3$ . The ball lands at  $t=3$ .

$-16t(t-3)$ ; **3 seconds**

*Scoring: 1 point for the factored form; 1 point for the landing time.*

|                  |
|------------------|
| <b>Total</b>     |
| <b>20 points</b> |