

A.SSE.A.2: Factoring Polynomials 5

- 1 The expression $x^2(x+2) - (x+2)$ is equivalent to
 - 1) x^2
 - 2) $x^2 - 1$
 - 3) $x^3 + 2x^2 - x + 2$
 - 4) $(x+1)(x-1)(x+2)$
- 2 When factored completely, $x^3 + 3x^2 - 4x - 12$ equals
 - 1) $(x+2)(x-2)(x-3)$
 - 2) $(x+2)(x-2)(x+3)$
 - 3) $(x^2 - 4)(x+3)$
 - 4) $(x^2 - 4)(x-3)$
- 3 When factored completely, the expression $x^3 - 2x^2 - 9x + 18$ is equivalent to
 - 1) $(x^2 - 9)(x - 2)$
 - 2) $(x - 2)(x - 3)(x + 3)$
 - 3) $(x - 2)^2(x - 3)(x + 3)$
 - 4) $(x - 3)^2(x - 2)$
- 4 When factored completely, the expression $3x^3 - 5x^2 - 48x + 80$ is equivalent to
 - 1) $(x^2 - 16)(3x - 5)$
 - 2) $(x^2 + 16)(3x - 5)(3x + 5)$
 - 3) $(x + 4)(x - 4)(3x - 5)$
 - 4) $(x + 4)(x - 4)(3x - 5)(3x - 5)$
- 5 The completely factored form of $2d^4 + 6d^3 - 18d^2 - 54d$ is
 - 1) $2d(d^2 - 9)(d + 3)$
 - 2) $2d(d^2 + 9)(d + 3)$
 - 3) $2d(d + 3)^2(d - 3)$
 - 4) $2d(d - 3)^2(d + 3)$
- 6 Factor completely: $x^3 + 3x^2 + 2x + 6$
- 7 Factor completely: $x^3 - 6x^2 - 25x + 150$
- 8 Over the set of integers, factor the expression $4x^3 - x^2 + 16x - 4$ completely.
- 9 Factor: $a^2 + ab + ac + bc$
- 10 Factor: $2x - xy + 2y - y^2$
- 11 Factor: $x^2 - y^2 + x - y$
- 12 Factor: $a^3 - ab + a^2 - b$

13 Factor: $1 + a - b - ab$

14 Factor: $2a - 1 - 2ab + b$

15 Factor: $ab - 3a - 2b + 6$

16 Factor: $a^2 - 3ab - a + 3b$

17 Factor: $6a^2 - 3ab - 2ac + bc$

18 Factor: $a^2 - 2ab - ac + 2bc$

19 Factor: $1 - x - x^2 + x^3$

20 Factor: $a^2b - a^2 - ab + a$

21 Factor: $a^6 - a^4 - a^2 + 1$

22 Factor: $2a + x - 2a^2x - ax^2$

23 What is the completely factored form of $k^4 - 4k^2 + 8k^3 - 32k + 12k^2 - 48$?

1) $(k - 2)(k - 2)(k + 3)(k + 4)$

2) $(k - 2)(k - 2)(k + 6)(k + 2)$

3) $(k + 2)(k - 2)(k + 3)(k + 4)$

4) $(k + 2)(k - 2)(k + 6)(k + 2)$

24 Which factorization is *incorrect*?

1) $4k^2 - 49 = (2k + 7)(2k - 7)$

2) $a^3 - 8b^3 = (a - 2b)(a^2 + 2ab + 4b^2)$

3) $m^3 + 3m^2 - 4m + 12 = (m - 2)^2(m + 3)$

4) $t^3 + 5t^2 + 6t + t^2 + 5t + 6 = (t + 1)(t + 2)(t + 3)$

25 Factor: $6a^2 + 9ab - 3b - 2a$

26 Factor: $ab + bc - b^2 - ac$

27 Factor: $3bc - 4ad + 6ac - 2bd$

28 Completely factor the following expression:
 $x^2 + 3xy + 3x^3 + y$

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Answer Section

1 ANS: 4

$$x^2(x+2) - (x+2)$$

$$(x^2 - 1)(x+2)$$

$$(x+1)(x-1)(x+2)$$

REF: 011426a2

2 ANS: 2

$$x^3 + 3x^2 - 4x - 12$$

$$x^2(x+3) - 4(x+3)$$

$$(x^2 - 4)(x+3)$$

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

REF: 061214a2

3 ANS: 2

$$x^3 - 2x^2 - 9x + 18$$

$$x^2(x-2) - 9(x-2)$$

$$(x^2 - 9)(x-2)$$

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

REF: 011511a2

4 ANS: 3

$$3x^3 - 5x^2 - 48x + 80$$

$$x^2(3x-5) - 16(3x-5)$$

$$(x^2 - 16)(3x-5)$$

$$(x+4)(x-4)(3x-5)$$

REF: 011317a2

5 ANS: 3

$$2d(d^3 + 3d^2 - 9d - 27)$$

$$2d(d^2(d+3) - 9(d+3))$$

$$2d(d^2 - 9)(d+3)$$

$$2d(d+3)(d-3)(d+3)$$

$$2d(d+3)^2(d-3)$$

REF: 081615a11

6 ANS:

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

REF: 011629a2

7 ANS:

$$x^2(x-6) - 25(x-6)$$

$$(x^2-25)(x-6)$$

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

REF: 061532a2

8 ANS:

$$x^2(4x-1) + 4(4x-1) = (x^2+4)(4x-1)$$

REF: 061727aia

9 ANS:

$$(a+b)(a+c)$$

REF: 039404a1

10 ANS:

$$(x+y)(2-y)$$

REF: 099806a1

11 ANS:

$$(x+y+1)(x-y)$$

REF: 069802a1

12 ANS:

$$(a^2-b)(a+1)$$

REF: 060502a1

13 ANS:

$$(a+1)(1-b)$$

REF: 069303a1

14 ANS:

$$(2a-1)(1-b)$$

REF: 019604a1

15 ANS:

$$(a-2)(b-3)$$

REF: 010502a1

16 ANS:

$$(a-1)(a-3b)$$

REF: 099403a1

17 ANS:
 $(3a - c)(2a - b)$

REF: 090502al

18 ANS:
 $(a - c)(a - 2b)$

REF: 010602al

19 ANS:
 $(1 + x)(1 - x)(1 - x)$

REF: 019806al

20 ANS:
 $a(a - 1)(b - 1)$

REF: 030501al

21 ANS:
 $(a^2 + 1)(a + 1)(a + 1)(a - 1)(a - 1)$

REF: 010003al

22 ANS:
 $(2a + x)(1 - ax)$

REF: 090402al

23 ANS: 4
 $k^4 - 4k^2 + 8k^3 - 32k + 12k^2 - 48$
 $k^2(k^2 - 4) + 8k(k^2 - 4) + 12(k^2 - 4)$
 $(k^2 - 4)(k^2 + 8k + 12)$
 $(k + 2)(k - 2)(k + 6)(k + 2)$

REF: fall1505aaii

24 ANS: 3
 $(m - 2)^2(m + 3) = (m^2 - 4m + 4)(m + 3) = m^3 + 3m^2 - 4m^2 - 12m + 4m + 12 = m^3 - m^2 - 8m + 12$

REF: 081605aaii

25 ANS:
 $(3a - 1)(2a + 3b)$

REF: 099904al

26 ANS:
 $(a - b)(b - c)$

REF: 089703al

27 ANS:
 $(3c - 2d)(2a + b)$

REF: 039703al

28 ANS:
 $3x^3 + x^2 + 3xy + y = x^2(3x + 1) + y(3x + 1) = (x^2 + y)(3x + 1)$

REF: 011828aii