JZ Maths

TMUA PRACTICE SET

Multivariate Factorisation Practice 1

Time limit: none — work at your own pace

Calculators: not permitted

Format: 15 multiple-choice questions

This is a TMUA-style practice set, intended for familiarisation with a specific topic.

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Question 1

Factorise completely: $x^2 - 5xy + 6y^2$.

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

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

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

D $(x + y)(x - 6y)$

Question 2

Factorise completely: $2a^2 + 5ab + 2b^2$.

A $(2a - b)(a - 2b)$

B $(2a + b)(a - 2b)$

C $(2a - b)(a + 2b)$

D $(2a + b)(a + 2b)$

Question 3

Factorise completely: $3m^2 - 7mn + 2n^2$.

A $(3m - n)(m - 2n)$

B $(3m + n)(m - 2n)$

C $(3m - n)(m + 2n)$

D $(3m - 2n)(m - n)$

Question 4

Factorise completely: $4p^2 - 4pq - 3q^2$.

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

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

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

D $(4p + 3q)(p - q)$

Question 5

Factorise completely over the real numbers: $x^3 - x^2y - 4y^3$.

A $(x + 2y)(x^2 - xy + 2y^2)$

B $(x - 2y)(x^2 - xy + 2y^2)$

C $(x - 2y)(x^2 + xy + 2y^2)$

D $(x - 2y)(x^2 + 2xy + 2y^2)$

Question 6

Factorise completely over the real numbers: $a^3 + a^2b - ab^2 + 15b^3$.

A $(a + 3b)(a^2 - 2ab + 5b^2)$

B $(a - 3b)(a^2 + 2ab + 5b^2)$

C $(a + 3b)(a^2 + 2ab + 5b^2)$

D $(a + 3b)(a^2 - 2ab - 5b^2)$

Question 7

Factorise completely: $2x^3 - x^2y - 7xy^2 + 6y^3$.

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

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

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

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

Question 8

Factorise completely: $2a^3 + 3a^2b - 3ab^2 - 2b^3$.

A $(a + b)(2a + b)(a + 2b)$

B $(a - b)(2a + b)(a + 2b)$

C $(a - b)(2a - b)(a + 2b)$

D $(a + b)(2a - b)(a - 2b)$

Question 9

Factorise completely: $p^3 + 2p^2q - 5pq^2 - 6q^3$.

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

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

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

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

Question 10

Factorise completely: $x^2 + xy - 3x - 2y^2 + 3y$.

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

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

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

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

Question 11

Factorise completely: $a^3 + a^2b + 3ab + 3b^2 - 4a - 4b$.

A $(a + b)(a^2 + 3b - 4)$

B $(a - b)(a^2 + 3b - 4)$

C $(a + b)(a^2 - 3b - 4)$

D $(a + b)(a^2 + 3b + 4)$

Question 12

Factorise completely: $2m^2 - 5mn + 2n^2 + 3m - 6n$.

A $(m - 2n)(2m - n + 3)$

B $(m + 2n)(2m - n + 3)$

C $(m - 2n)(2m + n + 3)$

D $(m - 2n)(2m - n - 3)$

Question 13

Factorise completely: $p^2 + pq - 3p - 4q - 4$.

A $(p + 4)(p + q - 1)$

B $(p - 4)(p + q - 1)$

C $(p - 4)(p + q + 1)$

D $(p + 4)(p - q - 1)$

Question 14

Factorise completely: $x^2 - 2xy + 4xz - 2yz + 3z^2$.

A $(x + z)(x - 2y + 3z)$

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

C $(x + z)(x + 2y + 3z)$

D $(x - z)(x + 2y - 3z)$

Question 15

Factorise completely: $2a^2 + ab^2 - 2ab - ac - b^3 + bc$.

A $(a - b)(2a + b^2 - c)$

B $(a + b)(2a + b^2 - c)$

C $(a - b)(2a - b^2 - c)$

D $(a - b)(2a + b^2 + c)$