EXPRESSWALA ACADEMY

Factorization

MCQ Test, Set 02

Time: 30 minutes | Maximum marks: 25

Name: _____ Class: _____ Date: _____

1. There are 25 questions. Each has exactly one correct answer: choose A, B, C or D.
2. Each correct answer carries 1 mark. There is no negative marking.
3. The key sheet and worked solutions are at the end of this test.

1. Factorize $16m^4 - p^4$.

A. $(2m - p)^2(4m^2 + p^2)$ **B.** $(2m + p)(2m - p)(4m^2 - p^2)$

C. $(2m + p)(2m - p)(4m^2 + p^2)$ **D.** $(2m + p)^2(4m^2 + p^2)$

2. The factors of $81t^2 - 64$ are

A. $(9t + 8)(9t - 8)$ **B.** $(9t - 8)^2$ **C.** $(9t + 8)^2$ **D.** $(81t + 8)(81t - 8)$

3. $9a^2 + 30ab + 25b^2 =$

A. $(3a + 5b)(3a - 5b)$ **B.** $(5a + 3b)^2$ **C.** $(3a + 5b)^2$ **D.** $(3a - 5b)^2$

4. The factors of $4x^2 + 20xy + 25y^2$ are

A. $(2x - 5y)^2$ **B.** $(2x + 5y)^2$ **C.** $(5x + 2y)^2$ **D.** $(2x + 5y)(2x - 5y)$

5. The factors of $49m^2 - 70m + 25$ are

A. $(7m - 5)^2$ **B.** $(7m + 5)^2$ **C.** $(5m - 7)^2$ **D.** $(7m + 5)(7m - 5)$

6. Factorize $x^2 - 14x + 49 - 36y^2$.

A. $(x - 7 - 6y)^2$ **B.** $(x + 7 + 6y)(x + 7 - 6y)$ **C.** $(x - 7 + 6y)(x - 7 - 6y)$ **D.** $(x + 7 - 6y)(x - 7 + 6y)$

7. $15a^2 + 22a + 8 =$

A. $(3a + 2)(5a + 4)$ **B.** $(3a - 2)(5a - 4)$ **C.** $(3a - 2)(5a + 4)$ **D.** $(3a + 4)(5a + 2)$

8. To factorize $4p^2 - 7p + 3$ by splitting the middle term, we need two numbers whose product is 4×3 and whose sum is -7. They are

A. -6 and -2 **B.** -12 and -1 **C.** -3 and -4 **D.** 3 and 4

9. To factorize $5z^2 - 13z + 6$ by splitting the middle term, we need two numbers whose product is 5×6 and whose sum is -13. They are

A. 3 and 10 **B.** -15 and -2 **C.** -3 and -10 **D.** -6 and -5

10. To factorize $12x^2 + 5x - 3$ by splitting the middle term, we need two numbers whose product is $12 \times (-3)$ and whose sum is 5. They are

A. -6 and 6 **B.** 4 and -9 **C.** -3 and 12 **D.** -4 and 9

11. The factors of $19b^2 + 181b + 90$ are

A. $(19b - 10)(b - 9)$ **B.** $(19b - 10)(b + 9)$ **C.** $(19b + 10)(b + 9)$ **D.** $(19b + 9)(b + 10)$

---

12. On factorizing, $-2t - t^2 + 3 =$

A. $(1 - t)(3 - t)$ **B.** $(1 - t)(t + 3)$ **C.** $(t + 3)(t - 1)$ **D.** $(t + 1)(t - 3)$

---

13. On factorizing, $29t - 40 - 3t^2 =$

A. $(3t - 5)(t - 8)$ **B.** $(3t - 5)(8 - t)$ **C.** $(-t - 8)(5 - 3t)$ **D.** $(3t + 5)(t + 8)$

---

14. $3(3a - 4c)^2 + 16(3a - 4c) - 12 =$

A. $(3a - 4c - 6)(9a - 12c - 2)$ **B.** $(3a - 4c - 6)(9a - 12c + 2)$

C. $(3a - 4c + 6)(9a - 12c + 2)$ **D.** $(3a - 4c + 6)(9a - 12c - 2)$

---

15. Factorize $5x^2 - 18xy + 9y^2$.

A. $(5x + 3y)(x + 3y)$ **B.** $(5x - 3y)(x - 3y)$ **C.** $(5x - 3y)(x + 3y)$ **D.** $(5x + 3y)(x - 3y)$

---

16. $6\sqrt{2}t^2 - 35t - 3\sqrt{2} =$

A. $(6\sqrt{2}t + 1)(t + 3\sqrt{2})$ **B.** $(6\sqrt{2}t - 1)(t - 3\sqrt{2})$

C. $(6\sqrt{2}t - 1)(t + 3\sqrt{2})$ **D.** $(6\sqrt{2}t + 1)(t - 3\sqrt{2})$

---

17. $11a^2 + 6a + \frac{9}{11} =$

A. $(11a + 3)\left(a + \frac{3}{11}\right)$ **B.** $(11a + 3)(a + 3)$

C. $(11a - 3)\left(a - \frac{3}{11}\right)$ **D.** $(11a - 3)\left(a + \frac{3}{11}\right)$

---

18. On factorizing, $3(m + 3)^2 + 13(m + 3)(n + 4) + 4(n + 4)^2 =$

A. $(3m + n + 7)(m + 4n + 7)$ **B.** $(3m + n + 13)(m + 4n + 19)$

C. $(3m + n - 13)(m + 4n + 19)$ **D.** $(3m + n + 13)(m + 4n - 19)$

---

19. Factorize $4x^2 + y^2 + 4z^2 + 4xy - 4yz - 8zx$.

A. $(4x + y - 4z)^2$ **B.** $(2x + y + 2z)^2$ **C.** $(-2x + y + 2z)^2$ **D.** $(2x + y - 2z)^2$

---

20. On factorizing, $b^3 - 6b^2 + 12b - 8 =$

A. $(b - 2)^3$ **B.** $(b - 2)(b^2 + 2b + 4)$ **C.** $(b + 2)^3$ **D.** $(b + 2)(b - 2)^2$

---

21. $m^3 - 125p^3 =$

A. $(m - 5p)(m^2 + 5mp + 25p^2)$ **B.** $(m - 5p)(m^2 + 10mp + 25p^2)$

C. $(m + 5p)(m^2 - 5mp + 25p^2)$ **D.** $(m - 5p)(m^2 - 5mp + 25p^2)$

---

22. On factorizing, $27 + 64x^3z^3 =$

A. $(16x^2z^2 + 12xz + 9)(3 - 4xz)$ **B.** $(16x^2z^2 - 24xz + 9)(4xz + 3)$

C. $(16x^2z^2 + 12xz + 9)(4xz + 3)$ **D.** $(16x^2z^2 - 12xz + 9)(4xz + 3)$

23. The factors of $(5m-3n)^3+(3n-2p)^3+(2p-5m)^3$ are

A. $(5m-3n)(3n-2p)(2p-5m)$ **B.** $3(5m-3n)(3n-2p)(2p-5m)$

C. 0 **D.** $-3(5m-3n)(3n-2p)(2p-5m)$

---

24. On factorizing, $m^5n-16mn^5=$

A. $mn(m+2n)^2(m-2n)^2$ **B.** $mn(m+2n)^2(m^2+4n^2)$

C. $mn(m-2n)^2(m^2+4n^2)$ **D.** $mn(m+2n)(m-2n)(m^2+4n^2)$

---

25. Factorize $25x^2+(5x^2+3)x+15$.

A. $(5x^2+5)(x+3)$ **B.** $(5x^2+3)(x-5)$ **C.** $(5x^2-3)(x+5)$ **D.** $(5x^2+3)(x+5)$

Key sheet

1. C	**2.** A	**3.** C	**4.** B	**5.** A
6. C	**7.** A	**8.** C	**9.** C	**10.** D
11. C	**12.** B	**13.** B	**14.** D	**15.** B
16. D	**17.** A	**18.** B	**19.** D	**20.** A
21. A	**22.** D	**23.** B	**24.** D	**25.** D

Solutions

1. Factorize $16m^4 - p^4$.

$16m^4 - p^4 = (4m^2)^2 - (p^2)^2$
$= (4m^2 + p^2)(4m^2 - p^2)$
$= (4m^2 + p^2)[(2m)^2 - p^2]$
$= (4m^2 + p^2)(2m + p)(2m - p)$

Ans: (C) $(2m + p)(2m - p)(4m^2 + p^2)$

---

2. The factors of $81t^2 - 64$ are

$81t^2 - 64 = (9t)^2 - 8^2$
$= (9t + 8)(9t - 8)$
using $a^2 - b^2 = (a + b)(a - b)$

Ans: (A) $(9t + 8)(9t - 8)$

---

3. $9a^2 + 30ab + 25b^2 =$

$9a^2 + 30ab + 25b^2 = (3a)^2 + (5b)^2 + 2(3a)(5b)$
$= (3a + 5b)^2$
$= (3a + 5b)(3a + 5b)$
using $a^2 + b^2 + 2ab = (a + b)^2$

Ans: (C) $(3a + 5b)^2$

---

4. The factors of $4x^2 + 20xy + 25y^2$ are

$4x^2 + 20xy + 25y^2 = (2x)^2 + (5y)^2 + 2(2x)(5y)$
$= (2x + 5y)^2$
$= (2x + 5y)(2x + 5y)$
using $a^2 + b^2 + 2ab = (a + b)^2$

Ans: (B) $(2x + 5y)^2$

---

5. The factors of $49m^2 - 70m + 25$ are

$49m^2 - 70m + 25 = (7m)^2 + 5^2 - 2(7m)(5)$
$= (7m - 5)^2$
$= (7m - 5)(7m - 5)$
using $a^2 + b^2 - 2ab = (a - b)^2$

Ans: (A) $(7m - 5)^2$

---

6. Factorize $x^2 - 14x + 49 - 36y^2$.

$x^2 - 14x + 49 - 36y^2 = (x - 7)^2 - (6y)^2$
$= (x - 7 + 6y)(x - 7 - 6y)$
using $a^2 - 2ab + b^2 = (a - b)^2$ and $a^2 - b^2 = (a + b)(a - b)$

Ans: (C) $(x - 7 + 6y)(x - 7 - 6y)$

---

7. $15a^2 + 22a + 8 =$

$15 \times 8 = 120$: $10 \times 12 = 120$ and $10 + 12 = 22$

$= 15a^2 + 10a + 12a + 8$

$= 5a(3a + 2) + 4(3a + 2)$

$= (3a + 2)(5a + 4)$

Ans: (A) $(3a + 2)(5a + 4)$

---

8. To factorize $4p^2 - 7p + 3$ by splitting the middle term, we need two numbers whose product is 4×3 and whose sum is -7. They are

$4 \times 3 = 12$

$(-3) \times (-4) = 12$ and $-3 - 4 = -7$

So the numbers are -3 and -4.

Ans: (C) -3 **and** -4

---

9. To factorize $5z^2 - 13z + 6$ by splitting the middle term, we need two numbers whose product is 5×6 and whose sum is -13. They are

$5 \times 6 = 30$

$(-3) \times (-10) = 30$ and $-3 - 10 = -13$

So the numbers are -3 and -10.

Ans: (C) -3 **and** -10

---

10. To factorize $12x^2 + 5x - 3$ by splitting the middle term, we need two numbers whose product is $12 \times (-3)$ and whose sum is 5. They are

$12 \times (-3) = -36$

$(-4) \times 9 = -36$ and $-4 + 9 = 5$

So the numbers are -4 and 9.

Ans: (D) -4 **and** 9

---

11. The factors of $19b^2 + 181b + 90$ are

$19 \times 90 = 1710$

$1710 = 2 \times 3 \times 3 \times 5 \times 19 = 10 \times 171$, and $10 + 171 = 181$

$= 19b^2 + 10b + 171b + 90$

$= b(19b + 10) + 9(19b + 10)$

$= (19b + 10)(b + 9)$

Ans: (C) $(19b + 10)(b + 9)$

---

12. On factorizing, $-2t - t^2 + 3 =$

Writing the terms in order: $-t^2 - 2t + 3$

$(-1) \times 3 = -3$: $(-3) \times 1 = -3$ and $-3 + 1 = -2$

$= -t^2 - 3t + t + 3$

$= -t(t + 3) + 1(t + 3)$

$= (t + 3)(1 - t)$

Ans: (B) $(1 - t)(t + 3)$

---

13. On factorizing, $29t - 40 - 3t^2 =$

Writing the terms in order: $-3t^2 + 29t - 40$

$(-3) \times (-40) = 120$: $5 \times 24 = 120$ and $5 + 24 = 29$

$= -3t^2 + 5t + 24t - 40$

$= -t(3t - 5) + 8(3t - 5)$

$= (3t - 5)(8 - t)$

Ans: (B) $(3t - 5)(8 - t)$

---

14. $3(3a - 4c)^2 + 16(3a - 4c) - 12 =$

Let $3a - 4c = p$

$3(3a - 4c)^2 + 16(3a - 4c) - 12 = 3p^2 + 16p - 12$

$3 \times (-12) = -36$: $(-2) \times 18 = -36$ and $-2 + 18 = 16$

$= 3p^2 - 2p + 18p - 12$

$= p(3p - 2) + 6(3p - 2)$

$= (3p - 2)(p + 6)$

$= [3(3a - 4c) - 2][(3a - 4c) + 6]$

$= (9a - 12c - 2)(3a - 4c + 6)$

Ans: (D) $(3a - 4c + 6)(9a - 12c - 2)$

---

15. Factorize $5x^2 - 18xy + 9y^2$.

$5 \times 9 = 45$: $(-3) \times (-15) = 45$ and $-3 - 15 = -18$

$= 5x^2 - 3xy - 15xy + 9y^2$

$= x(5x - 3y) - 3y(5x - 3y)$

$= (5x - 3y)(x - 3y)$

Ans: (B) $(5x - 3y)(x - 3y)$

---

16. $6\sqrt{2}t^2 - 35t - 3\sqrt{2} =$

$6\sqrt{2} \times (-3\sqrt{2}) = 6 \times (-3) \times 2 = -36$: $1 \times (-36) = -36$ and $1 - 36 = -35$

$= 6\sqrt{2}t^2 + t - 36t - 3\sqrt{2}$

$= t(6\sqrt{2}t + 1) - 3\sqrt{2}(6\sqrt{2}t + 1)$

$= (6\sqrt{2}t + 1)(t - 3\sqrt{2})$

Ans: (D) $(6\sqrt{2}t + 1)(t - 3\sqrt{2})$

---

17. $11a^2 + 6a + \frac{9}{11} =$

$11a^2 + 6a + \frac{9}{11} = \frac{121a^2 + 66a + 9}{11}$

$= \frac{1}{11}(121a^2 + 66a + 9)$

$= \frac{1}{11}[(11a)^2 + 3^2 + 2(11a)(3)]$

$= \frac{1}{11}(11a + 3)^2$

$= \left(a + \frac{3}{11}\right)(11a + 3)$

Ans: (A) $(11a + 3)\left(a + \frac{3}{11}\right)$

---

18. On factorizing, $3(m+3)^2+13(m+3)(n+4)+4(n+4)^2=$

Let $m+3=x$ and $n+4=y$

$3(m+3)^2+13(m+3)(n+4)+4(n+4)^2=3x^2+13xy+4y^2$

$3\times 4=12$: $1\times 12=12$ and $1+12=13$

$=3x^2+xy+12xy+4y^2$

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

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

$=[3(m+3)+(n+4)][(m+3)+4(n+4)]$

$=(3m+9+n+4)(m+3+4n+16)$

$=(3m+n+13)(m+4n+19)$

Ans: (B) $(3m+n+13)(m+4n+19)$

---

19. Factorize $4x^2+y^2+4z^2+4xy-4yz-8zx$.

$4x^2+y^2+4z^2+4xy-4yz-8zx=(2x)^2+y^2+(2z)^2+2(2x)(y)-2(y)(2z)-2(2z)(2x)$

$=(2x+y-2z)^2$

using $a^2+b^2+c^2+2ab-2bc-2ca=(a+b-c)^2$

Ans: (D) $(2x+y-2z)^2$

---

20. On factorizing, $b^3-6b^2+12b-8=$

$b^3-6b^2+12b-8=b^3-2^3-3(b)^2(2)+3(b)(2)^2$

$=(b-2)^3$

using $(a-b)^3=a^3-b^3-3ab(a-b)$

Ans: (A) $(b-2)^3$

---

21. $m^3-125p^3=$

$m^3-125p^3=m^3-(5p)^3$

$=(m-5p)[m^2+(m)(5p)+(5p)^2]$

$=(m-5p)(m^2+5mp+25p^2)$

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

Ans: (A) $(m-5p)(m^2+5mp+25p^2)$

---

22. On factorizing, $27+64x^3z^3=$

$27+64x^3z^3=3^3+(4xz)^3$

$=(3+4xz)[3^2-(3)(4xz)+(4xz)^2]$

$=(4xz+3)(16x^2z^2-12xz+9)$

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

Ans: (D) $(16x^2z^2-12xz+9)(4xz+3)$

---

23. The factors of $(5m-3n)^3+(3n-2p)^3+(2p-5m)^3$ are

Here $(5m-3n)+(3n-2p)+(2p-5m)=0$

If $a+b+c=0$, then $a^3+b^3+c^3=3abc$

$\therefore (5m-3n)^3+(3n-2p)^3+(2p-5m)^3=3(5m-3n)(3n-2p)(2p-5m)$

Ans: (B) $3(5m-3n)(3n-2p)(2p-5m)$

---

24. On factorizing, $m^5n - 16mn^5 =$

$m^5n - 16mn^5 = mn(m^4 - 16n^4)$

$= mn[(m^2)^2 - (4n^2)^2]$

$= mn(m^2 + 4n^2)(m^2 - 4n^2)$

$= mn(m^2 + 4n^2)[m^2 - (2n)^2]$

$= mn(m^2 + 4n^2)(m + 2n)(m - 2n)$

Ans: (D) $mn(m + 2n)(m - 2n)(m^2 + 4n^2)$

---

25. Factorize $25x^2 + (5x^2 + 3)x + 15$.

$25x^2 + (5x^2 + 3)x + 15 = 25x^2 + 5x^3 + 3x + 15$

$= 5x^3 + 25x^2 + 3x + 15$

$= 5x^2(x + 5) + 3(x + 5)$

$= (x + 5)(5x^2 + 3)$

Ans: (D) $(5x^2 + 3)(x + 5)$