

Factoring

1) **One** of the factors of $3y^3 + 15y^2 - 12y - 60$ is

- A) $y + 2$
- B) $y^2 - 2$
- C) $y^2 + 4$
- D) $y - 5$
- E) $y - 4$

2) If $4x^2 + 36x + C = (ax + b)^2$, then $a + b =$

- A) 11
- B) 7
- C) 9
- D) -7
- E) -9

3) **One** of the factors of $(2x - 1)^3 - 1$ is

- A) $4x^2 - 2x + 1$
- B) $2x$
- C) $2x - 1$
- D) $x - 2$
- E) $4x^2 + 2x + 1$

$$4) \frac{3(x^2 + 3)^{-1/3} - 2x^2(x^2 + 3)^{-4/3}}{(x^2 + 3)^{-4/3}} =$$

A) $x^2 + 9$

B) $3(1 + x)^{4/3}$

C) $\frac{3}{(1 + x)^{4/3}}$

D) $(2x + 3)(1 + x)^{4/3}$

E) $\frac{2x + 3}{(1 + x)^{4/3}}$

5) If $(2x - 1)^3 + 8 = (2x + 1)(mx^2 + nx + p)$, then $m + n + p$

A) 3

B) 7

C) 4

D) 1

E) 6

6) If the polynomial $27y^3 + 1$ factors into $(3y + 1)(My^2 + Ny + 1)$, then

$M + N =$

A) 6

B) 12

C) 15

D) 3

E) 9

7) One factor of $2t^{3/2} - 7t^{1/2} - 4t^{-1/2}$ is

A) $2t + 1$

B) $2t - 1$

C) $t - 2$

D) $t + 2$

E) $t + 4$

8) One factor of the polynomial $q^2 - p^2 + 4p - 4$, is

A) $(q - p + 2)$

B) $(q - p - 2)$

C) $(q + p + 1)$

D) $(q - p)$

E) $(q + p)$

9) One factor of the polynomial $(x^2 - 1)^2 + (x^2 - 1) - 12$ is

A) $x + 2$

B) $x - 1$

C) $x + 1$

D) $x + 3$

E) $x - 3$

10) One factor of $a^2 + 4b^2 + 4b - 4ab - 2a$, is

A) $a - 2b - 2$

B) $a + 2b + 2$

C) $a + 2b - 2$

D) $a - 2b + 2$

E) $a - b - 1$

11) One factor of $24 + 3(x - 1)^3$, is

A) $x^2 - 4x + 7$

B) $x^2 - 4x - 7$

C) $x^2 - 2x + 7$

D) $x^2 - 6x + 7$

E) $x^2 + x + 9$

12) If the expression $64 + (x - 3)^3$ factors into $(x + 1)(x^2 + Ax + B)$, then $A + B =$

(a) 27

(b) -27

(c) 47

(d) -47

(e) -37

13) One of the factors of $4x^3 + 4x^2y - 9xy^2 - 9y^3$ is equal to

- (a) $2x - 3y$
- (b) $x - y$
- (c) $x - 3y$
- (d) $2x + y$
- (e) $2x - y$

14) If the expression $x^{4n} - 1$ factors into $x^{4n} - 1 = (x^n - 1)A$ then A is equal to

- (a) $(x^n + 1)(x^{2n} + 1)$
- (b) $(x^n - 1)(x^{2n} + 1)$
- (c) $(x^n + 1)(x^n - 1)$
- (d) $x^{3n} + 1$
- (e) $x^{2n} + 1$

15) One factor of $6(4x^2 - 12xy + 9y^2) + 7(2x - 3y) - 3$ is

- (a) $6x - 9y - 1$
- (b) $4x + 6y - 1$
- (c) $6x - 9y + 3$
- (d) $4x - 6y - 1$
- (e) $6x - 9y - 3$

16) One of the factors of $3x^{5/2} - 9x^{3/2} + 6x^{1/2}$ is

- (a) $x - 1$
- (b) $x + 1$
- (c) $x + 2$
- (d) $3x - 1$
- (e) $3x - 2$

17) One factor of $y^4 + 64$ is:

- (a) $y^2 + 4y + 8$
- (b) $y^2 + 4y - 8$
- (c) $y^2 - 4y - 8$
- (d) $y^2 + 8$
- (e) $y^2 - 8$

18) If the expression $64 + (x-3)^3$ factors into $(x+1)(x^2 + Ax + B)$, then $A + B =$

- (f) 27
- (g) -27
- (h) 47
- (i) -47
- (j) -37

19) One of the factors of $4x^3 + 4x^2y - 9xy^2 - 9y^3$ is equal to

- (f) $2x - 3y$
- (g) $x - y$
- (h) $x - 3y$
- (i) $2x + y$
- (j) $2x - y$

20) One factor of $6(4x^2 - 12xy + 9y^2) + 7(2x - 3y) - 3$ is

- (f) $6x - 9y - 1$
- (g) $4x + 6y - 1$
- (h) $6x - 9y + 3$
- (i) $4x - 6y - 1$
- (j) $6x - 9y - 3$

21) If the expression $x^{4n} - 1$ factors into $x^{4n} - 1 = (x^n - 1)A$ then A is equal to

(f) $(x^n + 1)(x^{2n} + 1)$

(g) $(x^n - 1)(x^{2n} + 1)$

(h) $(x^n + 1)(x^n - 1)$

(i) $x^{3n} + 1$

(j) $x^{2n} + 1$

22) One of the factors of $3x^{5/2} - 9x^{3/2} + 6x^{1/2}$ is

(f) $x - 1$

(g) $x + 1$

(h) $x + 2$

(i) $3x - 1$

(j) $3x - 2$

23) One factor of $y^4 + 64$ is:

(f) $y^2 + 4y + 8$

(g) $y^2 + 4y - 8$

(h) $y^2 - 4y - 8$

(i) $y^2 + 8$

(j) $y^2 - 8$

24) One factor of $18x^5 + 15x^4z - 75x^3z^2$ is

(A) $3x - 5z$

B) $2x - 5z$

C) $3x + 25z$

D) $6x - 5z$

E) $3x - 25z$

25) One factor of $27z^9 + 64y^{12}$ is

A) $9z^6 - 12z^3y^4 + 16y^8$

B) $9z^6 + 12z^3y^2 + 16y^4$

C) $9z^6 - 12z^3y^4 + 4y^8$

D) $9z^6 + 12z^3y^4 + 8y^4$

E) $9z^6 - 12z^3y^4 + 2y^8$

26) The **sum** of the two factors of the polynomial $p^2q^2 - 10 - 2q^2 + 5p^2$, is

A) $p^2 + q^2 + 3$

B) $p^2 + q^2 - 7$

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

D) $p^2 - q^2 - 7$

E) $p^2 + q^2 - 3$

27) One factor of $(3a + 5)^2 + 6(3a + 5) - 16$ is

A) $(3a + 13)$

B) $(3a - 2)$

C) $(3a - 3)$

D) $(3a - 16)$

E) $(3a + 8)$

28) Sum of the factors of $(2a + 1)^3 - 8$ is equal to

A) $4a^2 + 10a + 6$

B) $4a^2 - 6a + 10$

C) $4a^2 + 10a + 8$

D) $4a^2 + 6a - 10$

E) $4a^2 + 10a - 6$

29) One factor of $x^2y^2 - 10xy + 25 - a^4$ is

A) $(xy + a^2 - 5)$

B) $(xy - a^2 + 5)$

C) $(xy + a^2 + 5)$

D) $(xy + a + 5)$

E) $(xy - a - 5)$

30) Factor $(x^2 + 1)^{1/2} + 2(x^2 + 1)^{-1/2}$

A) $\frac{x^2 + 3}{\sqrt{x^2 + 1}}$

31) Factor $2x^{1/3}(x - 2)^{2/3} - 5x^{4/3}(x - 2)^{-1/3}$

A) $\frac{(-3x - 4)\sqrt[3]{x}}{\sqrt[3]{x} - 2}$

32) One of the factors of $(2x + 3)^{\frac{3}{2}} - (2x + 3)^{\frac{1}{2}} - 2(2x + 3)^{-\frac{1}{2}}$

A) $2x + 1$

B) $x - 1$

C) $x - 2$

D) $x + 1$

E) $2x + 5$

33) One of the factors of $9 + x^3y^2 - 9x^3 - y^2$

A) $x^2 + x + 1$

B) $x^2 - x + 1$

C) $y - 9$

D) $y + 9$

E) $y^2 + y + 3$

34) One of the factors of $3x^3 - 2x^2 - 12x + 8$ is:

A) $x + 2$

B) $3x + 2$

C) $x - 4$

D) $x + 4$

E) $x - 1$

35) The expression $\left(x + \frac{1}{x}\right)^2 - \left(x - \frac{1}{x}\right)^2$ simplifies to:

A) 4

B) $\frac{4}{x}$

C) $-\frac{4}{x}$

D) 0

E) 8