

P6: 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. One factor of $18x^5 + 15x^4z - 75x^3z^2$ is

A) $3x - 5z$

B) $2x - 5z$

C) $3x + 25z$

D) $6x - 5z$

E) $3x - 25z$

19. 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) $9z^6 - 12z^3y^4 + 2y^8$

20. 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) $p^2 + q^2 - 3$

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

A) $(3a + 13)$

B) $(3a - 2)$

C) $(3a - 3)$

D) $(3a - 16)$

22. 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) $4a^2 + 10a - 6$

23. 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) $(xy - a - 5)$

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

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

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

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

26. 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) $2x+5$

27. 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) $y^2 + y + 3$

28. 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) $x - 1$

29. 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

30. One factor of the polynomial $8x^4 - 8x^3 + x - 1$, is

A) $4x^2 + 2x - 1$

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

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

31.
$$\frac{(1+2x^2)^{\frac{1}{3}} - (x^2-1)(1+2x^2)^{-\frac{2}{3}}}{(1+2x^2)^{-\frac{2}{3}}}$$

A) $x^2 - 1$

B) 1

C) x^2

D) $x^2 + 1$

E) $x^2 + 2$

32. One factor of $y^3 - x^2y + x^2 - y^2$, is

A) $y + x$

33. $\frac{(1+x^2)^{\frac{1}{2}} - x^2(1+x^2)^{-\frac{1}{2}}}{(1+x^2)^{-\frac{3}{2}}} =$

A) $1 + x^2$

34. One factor of $54 + 2(2x + 1)^3$ is

A) $(x + 2)$

35. One factor of $y^{\frac{1}{4}} + y^{-\frac{3}{4}} - 2y^{-\frac{7}{4}}$ is

A) $(y - 2)$

B) $(y - 3)$

C) $(y + 3)$

D) $(y - 1)$

36. If $4x^2y^2 - 36xy + k + 1$ is a perfect square trinomial, then $k =$

A) 82

B) 48

C) 8

D) 80

E) 24

37. One of the factors of $4y^5 - y^3 + 4y^2 - 1$ is

A) $y^2 - y + 1$

B) $y + 2$

C) $y - 1$

D) $y^2 + y + 1$

E) $y - 2$

38. If $18(x + 1)^{-1/2} + 2(x + 1)^{1/2} = \frac{A(x+B)}{(x+1)^{1/2}}$, then $A + B =$

A) 10

B) -2

C) 2

D) 8

E) 12

39. $|2x + (y - 1)||2x - (y - 1)| + |2x - (y - 1)|^2 =$

A) $8x^2 + 2xy - 4x$

B) $8x^2 - 4xy - 4x$

C) $8x^2 - 4xy + 4x$

D) $8x^2 - 2xy + 4x$

E) $8x^2 + 4xy - 4x$