(Type-8)

सरलीकरण
Simplification

1. $\frac{1}{\sqrt{3}-\sqrt{2}}$ =

(A) $\sqrt{2}-\sqrt{3}$ (B) $\sqrt{3}-\sqrt{2}$

(C) $\sqrt{3}+\sqrt{2}$ (D) None of these

2. $\frac{1}{2\sqrt{2}-\sqrt{3}}$

(A) $2\sqrt{2}+\sqrt{3}$ (B) $\frac{2\sqrt{2}+\sqrt{3}}{5}$

(C) $2\sqrt{2}-\sqrt{3}$ (D) $\frac{2\sqrt{2}+\sqrt{5}}{11}$

3. $\frac{1}{\sqrt{2}+\sqrt{3}-\sqrt{5}}$

(A) $\sqrt{2}+\sqrt{3}+\sqrt{5}$ (B) $\frac{\sqrt{2}+\sqrt{3}+\sqrt{5}}{2}$

(C) $\frac{\sqrt{2}+\sqrt{3}+\sqrt{5}}{2\sqrt{6}}$ (D) $\sqrt{2}+\sqrt{3}-\sqrt{5}$

4. If $\frac{\sqrt{3}-1}{\sqrt{3}+1}=a+b\sqrt{3}$,then find a, b = ?

यदि $\frac{\sqrt{3}-1}{\sqrt{3}+1}=a+b\sqrt{3}$ हो, तो ज्ञात कीजिये a, b =?

(A) a = 2, b = 1 (B) a = 2, b = – 1

(C) a = 3, b = – 2 (D) a = 1, b = – 2

5. If $\frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}}=a+b\sqrt{15}$,then find a, b = ?

यदि $\frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}}=a+b\sqrt{15}$ हो, तो ज्ञात कीजिये a, b =?

(A) a = 3, b = 2 (B) a = 4, b = 1

(C) a = 5, b = 3 (D) a = 3, b = – 5

6. If $\frac{4+2\sqrt{5}}{4-3\sqrt{5}}=a+b\sqrt{5}$,then find a, b = ?

यदि $\frac{4+2\sqrt{5}}{4-3\sqrt{5}}=a+b\sqrt{5}$ हो, तो ज्ञात कीजिये a, b =?

(A) $a=\frac{46}{29},b=\frac{-20}{29}$ (B) $a=\frac{46}{29},b=\frac{20}{29}$

(C) $a=\frac{46}{29},b=\frac{20}{29}$ (D) $a=\frac{-46}{29},b=\frac{-20}{29}$

7. If $\frac{5+2\sqrt{3}}{7+4\sqrt{3}}=a+b\sqrt{3}$, then find a, b = ?

यदि $\frac{5+2\sqrt{3}}{7+4\sqrt{3}}=a+b\sqrt{3}$ हो, तो ज्ञात कीजिये a, b =?

(A) a = 11, b = 6 (B) a = – 11, b = 6

(C) a = 11, b = – 6 (D) a = – 11, b = – 6

8. If $\frac{3\sqrt{2}-2\sqrt{3}}{\sqrt{3}+\sqrt{2}}=a+b\sqrt{6}$ then a, b = ?

यदि $\frac{3\sqrt{2}-2\sqrt{3}}{\sqrt{3}+\sqrt{2}}=a+b\sqrt{6}$ हो, तो ज्ञात कीजिये a, b =?

(A) a = 12, b = – 5 (B) a = – 12, b = 5

(C) a = 12, b = – 5 (D) a = 12, b = 5

9. If $\frac{\sqrt{2}+\sqrt{3}}{3\sqrt{2}-2\sqrt{3}}=a+b\sqrt{6}$, then find a, b = ?

यदि $\frac{\sqrt{2}+\sqrt{3}}{3\sqrt{2}-2\sqrt{3}}=a+b\sqrt{6}$,हो, तो ज्ञात कीजिये a, b =?

(A) $a=2,b=\frac{5}{6}$ (B) $a=\frac{5}{6},b=2$

(C) $a=4,b=\frac{5}{3}$ (D) $a=\frac{5}{3},b=4$

10. If a, b are rational no and $(a-1)\sqrt{2}+3=b\sqrt{2}+a$, then find (a + b) = ?

यदि a, b परिमेय संख्याएँ हों और $(a-1)\sqrt{2}+3=b\sqrt{2}+a$ हो, तो ज्ञात कीजिये (a + b) =?

(A) – 5 (B) 3

(C) – 3 (D) 5

11. $\sqrt{11+2\sqrt{30}}$

(A) $\sqrt{5}+\sqrt{6}$ (B) $\sqrt{5}-\sqrt{6}$

(C) $\frac{\sqrt{5}+\sqrt{6}}{2}$ (D) $\sqrt{11-2\sqrt{30}}$

12. $\sqrt{12-\sqrt{140}}$

(A) $\sqrt{7}+\sqrt{5}$ (B) $\sqrt{7}-\sqrt{5}$

(C) $\sqrt{12-\sqrt{140}}$ (D) None of these

13. $\sqrt{4-\sqrt{15}}$

(A) $\frac{\sqrt{5}+\sqrt{3}}{2}$ (B) $\frac{\sqrt{5}-\sqrt{3}}{2}$

(C) $\sqrt{15-\sqrt{4}}$ (D) $\frac{\sqrt{5}-\sqrt{3}}{\sqrt{2}}$

14. $\sqrt{3-\sqrt{5}}$

(A) $\frac{\sqrt{5}-\sqrt{1}}{\sqrt{2}}$ (B) $\sqrt{5-\sqrt{3}}$

(C) $\frac{\sqrt{5}+\sqrt{1}}{2}$ (D) $\frac{\sqrt{5}+1}{\sqrt{2}}$

15. If $\sqrt{21-8\sqrt{5}}=\sqrt{5}a-b$, then a + b = ?

यदि $\sqrt{21-8\sqrt{5}}=\sqrt{5}a-b$ हो, तो a + b =?

(A) – 5 (B) – 3

(C) – 2 (D) 5

16. If $\sqrt{86-18\sqrt{5}}=a+b\sqrt{5}$, then a – b = ?

यदि $\sqrt{86-18\sqrt{5}}=a+b\sqrt{5}$ हो, तो a – b =?

(A) $9+\sqrt{5}$ (B) $9-\sqrt{5}$

(C) 10 (D) – 10

17. If $\sqrt{139-80\sqrt{3}}=a+b\sqrt{3}$, then b = ?

यदि $\sqrt{139-80\sqrt{3}}=a+b\sqrt{3}$ हो, तो b =?

(A) 5 (B) 8

(C) – 5 (D) 16

18. Square root of $13-4\sqrt{3}$ is—

$13-4\sqrt{3}$ का वर्गमूल ज्ञात करें?

(A) $\sqrt{12}+1$ (B) $2\sqrt{3}+7$

(C) $\sqrt{12}-1$ (D) $2\sqrt{3}-7$

19. Square root of $139-80\sqrt{3}$ is—

$139-80\sqrt{3}$ का वर्गमूल ज्ञात करें?

(A) $5\sqrt{3}+8$ (B) $5\sqrt{3}-8$

(C) $5\sqrt{3}+12$ (D) $5\sqrt{3}-12$

20. The square root of $\left(3-\sqrt{5}\right)$ is—

$\left(3-\sqrt{5}\right)$ का वर्गमूल है–

(A) $\left(\sqrt{3}-5^{\frac{1}{4}}\right)$ (B) $\frac{1}{2}\left(\sqrt{5}-\sqrt{3}\right)$

(C) $\frac{1}{2}\left(\sqrt{5}-1\right)$ (D) $\frac{1}{\sqrt{2}}\left(\sqrt{5}-1\right)$

21. Find square -

वर्ग ज्ञात कीजिए -

(A) 295 (B) 995
(C) 43 (D) 58
(E) 62 (F) 91
(G) 108 (H) 132
(I) 88 (J) 54
(K) 219 (L) 191
(M) 308 (N) 284
(O) 162 (P) 138
(Q) 272 (R) 809
(S) 476 (T) 512
(U) 678 (V) 2032
(W) 785 (X) 796
(Y) 31005 (Z) 10005

22. Find square root -

वर्गमूल ज्ञात कीजिए -

(i) 45 (ii) 220
(iii) 108 (iv) 385
(v) 9801 (vi) 69696
(vii) 7744 (viii) 30976
(ix) 47089 (x) 26569

23. Find the value of $\sqrt{4444355556}+\sqrt{9999800001}+\sqrt{1111088889}\cdot\sqrt{4444355556}+\sqrt{9999800001}+\sqrt{1111088889}$ का मान ज्ञात कीजिए।

(A) 18889998 (B) 199998
(C) 1999888 (D) 1999889

24. Which may be perfect square number ?

कौनसा पूर्ण वर्ग है–

(A) 2149184 (B) 2039184
(C) 2039186 (D) 2039188

25. The square root of which of the following is a rational number —

निम्नलिखित में से किसका वर्गमूल एक परिमेय संख्या है–

(A) 625049 (B) 12549
(C) 135424 (D) 576828

26. The square root of which of the following is a rational number -
निम्नलिखित में से किसका वर्गमूल एक परिमेय संख्या है-
(A) 5535.36 (B) 3152.88
(C) 72905.2 (D) 67508.5

27. The square root of which of the following is a rational number -
निम्नलिखित में से किसका वर्गमूल एक परिमेय संख्या है-
(A) 5823.82 (B) 22504.9
(C) 2460.14 (D) 1489.96

28. The square root of which of the following is a rational number -
निम्नलिखित में से किसका वर्गमूल एक परिमेय संख्या है-
(A) 1250.49 (B) 6250.49
(C) 1354.24 (D) 5768.28

29. The square root of which of the following is a rational number -
निम्नलिखित में से किसका वर्गमूल एक परिमेय संख्या है-
(A) 2460.16 (B) 1252.49
(C) 7268.54 (D) 62504.9

30. Which of the following is a perfect square ?
निम्न में से कौन सा पूर्ण वर्ग है?
(A) 3497497 (B) 4587632
(C) 1046529 (D) 1034758

31. The smallest number that should be added to the number 8958 so that the result is a perfect square is—
वह न्यूनतम संख्या जो 8958 में जोड़ने पर परिणाम एक पूर्ण वर्ग संख्या हो?
(A) 67 (B) 69
(C) 79 (D) 77

32. What least number must be sustracted from 923604 so that it becomes a perfect square ?
923604 से कम से कौन सी संख्या घटाई जाये ताकि यह एक पूर्ण वर्ग बन जाये?
(A)78 (B) 79
(C) 83 (D) 84

33. What least number must be added to 386822 so that it becomes a perfect square ?
386822 में कम से कौन सी संख्या जोडी जाये ताकि यह एक पूर्ण वर्ग बन जाये?
(A) 57 (B) 22
(C) 62 (D) 67

34. N is a 3 digit number, n^2 = ... 54 How many value of n are possible ?
N एक 3 अंक की संख्या है n^2 = ...54 तो n की कितने मान संभव है?
(A) 0 (B) 1
(C) 2 (D) 3

35. ab7n is a perfect square no. How many values of n is possible?
ab7n एक पूर्ण वर्ग संख्या है, तो n के कितने मान संभव है?
(A) 0 (B) 1
(C) 2 (D) 3

36. A 4 digit number of the form AABB a perfect square, what is the value of (A – B)?
4 अंको की संख्या AABB के रूप में पूर्ण वर्ग हैं, तो (A – B) का मान ज्ञात करो?
(A) 4 (B) 5
(C) 7 (D) 3

37. x + a(a + 2) is a perfect square then what should be the value of x ?
यदि x + a(a + 2) एक पूर्ण वर्ग है, तो x का मान क्या होगा?
(A) 9 (B) 4
(C) 1 (D) 3

38. $\sqrt{(23 \times 24 \times 25 \times 26 + 1)}$
(A) Rational number / परिमेय संख्या
(B) Irrational number / अपरिमेय संख्या
(C) Rational integer / परिमेय पूर्णांक
(D) None of these / इनमें से कोई नहीं

39. When 96 is added to a perfect square number then another perfect square is obtained. How many such pairs of perfect square exist?
जब एक पूर्ण वर्ग संख्या में 96 जोड़ा जाता है, तो एक पूर्ण वर्ग संख्या प्राप्त होती है, तो इस प्रकार पूर्ण वर्ग के कितने जोड़े संभव हैं?
(A) 0 (B) 1
(C) 2 (D) 4

40. When 101 is added to a perfect square number then we get another perfect square number, so how many such pairs are possible?
जब किसी पूर्ण वर्ग संख्या में 101 जोड़ा जाता है, तो एक पूर्ण वर्ग संख्या प्राप्त होती है, तो इस प्रकार के कितने जोड़े संभव हैं?
(A) 1 (B) 2
(C) 3 (D) 4

41. What will be add in 3335×3337 to make perfect square ?
3335×3337 क्या जोड़ा जाये कि पूर्ण वर्ग संख्या बन जाये?
(A) 1 (B) 4
(C) 9 (D) 16

42. What will be add in 6561×6565 to make perfect square ?
6561×6565 क्या जोड़ा जाये कि पूर्ण वर्ग संख्या बन जाये?
(A) 1 (B) 4
(C) 9 (D) 16

43. What will be add in 6541×6542 to make perfect square ?
6541×6542 में क्या जोड़े की पूर्ण वर्ग संख्या बनें?
(A) 6541 (B) 3521
(C) 6542 (D) None of these

44. What will be subtract in 3011×3012 to make perfect square?
3011×3012 में क्या घटायें की पूर्ण वर्ग संख्या बनें।
(A) 3011 (B) 3012
(C) 1506 (D) 1505

45. If $N = (12345)^2 + 12345 + 12346$ then $\sqrt{N} = ?$
यदि $N = (12345)^2 + 12345 + 12346$ हो, तो $\sqrt{N} = ?$
(A) 12345 (B) 12346
(C) 12378 (D) 12396

46. Find Cube-
घन ज्ञात कीजिए -
(A) 17 (B) 13
(C) 21 (D) 51
(E) 33 (F) 66
(G) 42 (H) 34
(I) 104 (J) 119

47. Find Cube root-
घनमूल ज्ञात कीजिए–
(A) 1728 (B) 226981
(C) 4251528 (D) 438976
(E) 3241792 (F) 238328

48. How many perfect cube no. between 1000 to 130000 which are exactly divisible by 5
1000 और 130000 के बीच कितनी संख्याएं है जो पूर्ण घन संख्या है और 5 से विभाजित भी हो?
(A) 7 (B) 8
(C) 9 (D) 10

49. Which are of the following is perfect cube-
निम्न में से पूर्ण घन संख्या कौनसी है?
(A) 156250 (B)1562500
(C) 15625000 (D) 156250000

50. Find the value of
$\sqrt{(500 \times 501 \times 502 \times 503 + 1)} = ?$
$\sqrt{(500 \times 501 \times 502 \times 503 + 1)}$ का मान ज्ञात कीजिए।
(A) 251602 (B) 251501
(C) 250015 (D) 249102

51. Find the value of $\sqrt{7+4\sqrt{3}} - \sqrt{28+10\sqrt{3}} + \dfrac{\sqrt{11}}{\sqrt{20+6\sqrt{11}}+\sqrt{20-6\sqrt{11}}} = ?$
$\sqrt{7+4\sqrt{3}} - \sqrt{28+10\sqrt{3}} + \dfrac{\sqrt{11}}{\sqrt{20+6\sqrt{11}}+\sqrt{20-6\sqrt{11}}}$ का मान ज्ञात कीजिए।
(A) $2\frac{1}{2}$ (B) $-2\frac{1}{2}$
(C) $3\frac{1}{2}$ (D) $-3\frac{1}{2}$

52. $423 \times 424 \times 425 \times 426 + 1$ is ?
$423 \times 424 \times 425 \times 426 + 1$ संख्या है।
(A) Rational number/ परिमेय संख्या
(B) Irrational number/ अपरिमेय संख्या
(C) Rational integer / परिमेय पूर्णांक
(D) None of these/ इनमें से कोई नहीं

53. Which of the following options is the square root of the expression $(3^{34} + 3^{35})$
निम्न में से कौन-सा व्यंजक $(3^{34} + 3^{35})$ का वर्गमूल निरूपित करता हैं –
(A) $\sqrt{2} \times 13^{17.25}$ (B) $6^{34.5}$
(C) 2×3^{17} (D) $3^{34.5}$

Solutions

1. $\frac{1}{\sqrt{3}-\sqrt{2}} \times \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}+\sqrt{2}} = \frac{\sqrt{3}+\sqrt{2}}{\left(\sqrt{3}\right)^2-\left(\sqrt{2}\right)^2} = \sqrt{3}+\sqrt{2}$

2. $\frac{1}{2\sqrt{2}-\sqrt{3}} \times \frac{2\sqrt{2}+\sqrt{3}}{2\sqrt{2}+\sqrt{3}} = \frac{2\sqrt{2}+\sqrt{3}}{\left(2\sqrt{2}\right)^2-\left(\sqrt{3}\right)^2} = \frac{2\sqrt{2}+\sqrt{3}}{5}$

3. $\frac{1}{\sqrt{2}+\sqrt{3}-\sqrt{5}} \times \frac{\sqrt{2}+\sqrt{3}+\sqrt{5}}{\sqrt{2}+\sqrt{3}+\sqrt{5}} = \frac{\sqrt{2}+\sqrt{3}+\sqrt{5}}{\left(\sqrt{2}+\sqrt{3}\right)^2-\left(\sqrt{5}\right)^2}$

$= \frac{\sqrt{2}+\sqrt{3}+\sqrt{5}}{2\sqrt{6}}$

4. (B) $\frac{\sqrt{3}-1}{\sqrt{3}+1} = a+b\sqrt{3}$

$\Rightarrow \frac{\sqrt{3}-1}{\sqrt{3}+1} \times \frac{\sqrt{3}-1}{\sqrt{3}-1} = a+b\sqrt{3}$

$\Rightarrow \frac{3+1-2\sqrt{3}}{\left(\sqrt{3}\right)^2-(1)^2} = a+b\sqrt{3}$

$\Rightarrow 2-\sqrt{3} = a+b\sqrt{3}$

By comparison,
a = 2, b = –1

5. (B) $\frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}} = a+b\sqrt{15}$

$\Rightarrow \frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}} \times \frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}+\sqrt{3}} = a+b\sqrt{15}$

$\Rightarrow \frac{8+2\sqrt{15}}{2} = a+b\sqrt{15} = 4+\sqrt{15}$

By comparison,
a = 4, b = 1

6. (D) $\frac{4+2\sqrt{5}}{4-3\sqrt{5}} = a+b\sqrt{5}$

$\Rightarrow \frac{4+2\sqrt{5}}{4-3\sqrt{5}} \times \frac{4+3\sqrt{5}}{4+3\sqrt{5}} = a+b\sqrt{5}$

$\Rightarrow \frac{16+30+8\sqrt{5}+12\sqrt{5}}{(4)^2-\left(3\sqrt{5}\right)^2} = a+b\sqrt{5}$

$\Rightarrow -\frac{46}{29}-\frac{20\sqrt{5}}{29} = a+b\sqrt{5}$

By comparison,

$a = -\frac{46}{29}, \quad b = -\frac{20}{29}$

7. (C) $\frac{5+2\sqrt{3}}{7+4\sqrt{3}} = a+b\sqrt{3}$

$\Rightarrow \frac{5+2\sqrt{3}}{7+4\sqrt{3}} \times \frac{7-4\sqrt{3}}{7-4\sqrt{3}} = a+b\sqrt{3}$

$\Rightarrow \frac{35-24+14\sqrt{3}-20\sqrt{3}}{(7)^2-\left(4\sqrt{3}\right)^2} = a+b\sqrt{3}$

$\Rightarrow 11-6\sqrt{3} = a+b\sqrt{3}$

By comparison,
a = 11, b = –6

8. (B) $\frac{3\sqrt{2}-2\sqrt{3}}{\sqrt{3}+\sqrt{2}} = a+b\sqrt{6}$

$\Rightarrow \frac{3\sqrt{2}-2\sqrt{3}}{\sqrt{3}+\sqrt{2}} \times \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}-\sqrt{2}} = a+b\sqrt{6}$

$\Rightarrow \frac{-6-6+3\sqrt{6}+2\sqrt{6}}{\left(\sqrt{3}\right)^2-\left(\sqrt{2}\right)^2} = a+b\sqrt{6}$

$\Rightarrow -12 + 5\sqrt{6} = a+b\sqrt{6}$

By comparison,
a = –12, b = 5

9. (A) $\frac{\sqrt{2}+\sqrt{3}}{3\sqrt{2}-2\sqrt{3}} = a+b\sqrt{6}$

$\Rightarrow \frac{\sqrt{2}+\sqrt{3}}{3\sqrt{2}-2\sqrt{3}} \times \frac{3\sqrt{2}+2\sqrt{3}}{3\sqrt{2}+2\sqrt{3}} = a+b\sqrt{6}$

$\Rightarrow \frac{6+6+3\sqrt{6}+2\sqrt{6}}{\left(3\sqrt{2}\right)^2-\left(2\sqrt{3}\right)^2} = a+b\sqrt{6}$

$\Rightarrow 2+\frac{5}{6}\sqrt{6} = a+b\sqrt{6}$

By comparison,

$\Rightarrow a = 2, b = \frac{5}{6}$

10. (D) ATQ, $(a-1)\sqrt{2}+3 = b\sqrt{2}+a$

By comparison,
a = 3
and (a – 1) = b
⇒ (3 – 1) = b
⇒ b = 2
So, (a + b) = 2 + 3 = 5

11. (A) $\sqrt{11+2\sqrt{30}} = \sqrt{\left(\sqrt{5}\right)^2+\left(\sqrt{6}\right)^2+2\left(\sqrt{5}\right)\left(\sqrt{6}\right)}$

$= \sqrt{5}+\sqrt{6}$

12. (B) $\sqrt{12-\sqrt{140}} = \sqrt{\left(\sqrt{5}\right)^2-\left(\sqrt{7}\right)^2-2\left(\sqrt{5}\right)\left(\sqrt{7}\right)}$

$= \sqrt{7}-\sqrt{5}$

13. (D) $\sqrt{4-\sqrt{15}} = \sqrt{\frac{8-2\sqrt{15}}{2}} = \sqrt{\frac{\left(\sqrt{5}\right)^2+\left(\sqrt{3}\right)^2-2\left(\sqrt{5}\right)\left(\sqrt{3}\right)}{\left(\sqrt{2}\right)^2}}$

$= \frac{\sqrt{5}-\sqrt{3}}{\sqrt{2}}$

14. (A) $\sqrt{3-\sqrt{5}} = \sqrt{\frac{6-2\sqrt{5}}{2}} = \sqrt{\frac{\left(\sqrt{5}\right)^2+(1)^2-2\times\sqrt{5}\times1}{\left(\sqrt{2}\right)^2}}$

$= \frac{\sqrt{5}-1}{\sqrt{2}}$

15. (D) $\sqrt{21-8\sqrt{5}} = \sqrt{5}a-b$

$\Rightarrow \sqrt{(4)^2+\left(\sqrt{5}\right)^2-2\times4\times\sqrt{5}} = \sqrt{5}a-b$

$\Rightarrow \left(\sqrt{5}-4\right) = \sqrt{5}a-b$

By Comparison,
a = 1, b = 4
So, a + b = 1 + 4 = 5

16. (C) $\sqrt{86-18\sqrt{5}} = a+b\sqrt{5}$

$\Rightarrow \sqrt{(9)^2+\left(\sqrt{5}\right)^2-2\times\sqrt{5}\times9} = a+b\sqrt{5}$

$\Rightarrow \left(9-\sqrt{5}\right) = a+b\sqrt{5}$

By comparison,
a = 9, b = -1
So, a – b = 9 + 1 = **10**

17. (A) $\sqrt{139-80\sqrt{3}} = a+b\sqrt{3}$

$\Rightarrow \sqrt{(8)^2+\left(5\sqrt{3}\right)^2-2\times8\times5\sqrt{3}} = a+b\sqrt{3}$

$\Rightarrow 5\sqrt{3}-8 = a+b\sqrt{3}$

By Comparison,
b = 5

18. (C) $\sqrt{13-4\sqrt{3}} = \sqrt{\left(\sqrt{12}\right)^2+(1)^2-2\times\sqrt{12}\times1}$

$= \sqrt{12}-1$

19. (B) $\sqrt{139-80\sqrt{3}} = \sqrt{(8)^2+\left(5\sqrt{3}\right)^2-2\times8\times5\sqrt{3}}$

$= 5\sqrt{3}-8$

20. (D) $\sqrt{3-\sqrt{5}} = \sqrt{\frac{6-2\sqrt{5}}{2}}$

$= \sqrt{\frac{\left(\sqrt{5}\right)^2+(1)^2-2\times\sqrt{5}\times1}{\left(\sqrt{2}\right)^2}} = \frac{\sqrt{5}-1}{\sqrt{2}}$

21. (A) $(295)^2 = (2)^2$ / 2 × 2 × 9 / 2 × 2 × 5 + 9^2/ 2 × 9 × 5 / 5^2 = 4/ 36/ 101/ 90/ 25 = 87025
(B) $(995)^2 = (9)^2$/ 2 × 9 × 9/ 2 × 9 × 5 + 9^2/ 2 × 9 × 5 / 5^2 = 81/ 162 / 171 / 90/ 25 = 990025
(C) $(43)^2 = (4)^2$ / 2 × 4 × 3/ $(3)^2$ = 16/ 24 / 9 = 1849
(D) $(58)^2 = (5)^2$ / 2×5×8/ $(8)^2$ = 25/ 80 / 64 = 3364
(E) $(62)^2 = (6)^2$ / 2 × 6 × 2 / $(2)^2$ = 36/24/ 4 = 3844
(F) $(91)^2 = (9)^2$ / 2 × 9 × 1 / $(1)^2$ = 81/ 18 / 1 = 8281
(G) $(108)^2 = (1)^2$ / 2 × 1 × 0 / 2 × 1 × 8 + 0^2 / 2 × 0 × 8 / $(8)^2$ = 1/ 0 / 16 / 0 / 64 = 11664
(H) $(132)^2 = (1)^2$ / 2 × 1 × 3 / 2 × 1 × 2 + 3^2 / 2 × 3 × 2 / $(2)^2$ = 1/ 6 / 13 / 12 / 4 = 17424
(I) $(88)^2 = (8)^2$ / 2 × 8 ×8/$(8)^2$ = 64/128/64 = 7744
(J) $(54)^2 = (5)^2$ / 2 × 5× 4 / $(4)^2$ = 25/ 40/ 16 = 2916
(K) $(219)^2 = (2)^2$ / 2 × 2 × 1/ 2 × 2 × 9 + 1^2/ $(9)^2$ = 4/ 4 / 37 / 18 / 81 = 47961
(L) $(191)^2 = (1)^2$ / 2 × 1 × 9/ 2 × 1 × 1 + 9^2/ 2 × 9 × 1 / $(1)^2$ = 1/ 18 / 83 / 18 / 1 = 36481
(M) $(308)^2 = (3)^2$ / 2 × 3 × 0/ 2 × 3 × 8 + 0^2/ 2 × 0 × 8 / $(8)^2$ = 9/ 0 / 48 / 0 / 64 = 94864
(N) $(284)^2 = (2)^2$ / 2 × 2 × 8/ 2 × 2 × 4 + 8^2/ 2 × 8 × 4 / $(4)^2$ = 4/ 32 / 80 / 64 / 16 = 80656
(O) $(162)^2 = (1)^2$ / 2 × 1 × 6/ 2 × 1 × 2 + 6^2/ 2 × 6 × 2 / $(2)^2$ = 1/ 12 / 40 / 24 / 4 = 26244
(P) $(138)^2 = (1)^2$ / 2 × 1 × 3/ 2 × 1 × 8 + 3^2/ 2 × 3 × 8 / $(8)^2$ = 1/ 6 / 25 / 48 / 64 = 19044
(Q) $(272)^2 = (2)^2$ / 2 × 2 × 7/ 2 × 2 × 2 + 7^2/ 2 × 7 × 2 / $(2)^2$ = 4/ 28 / 57 / 28 / 4 = 73984
(R) $(809)^2 = (8)^2$ / 2 × 8 × 0/ 2 × 8 × 9 + 0^2/ 2 × 0 × 9 / $(9)^2$ = 64/ 0 / 144 / 0 / 81 = 654481
(S) $(476)^2 = (4)^2$ / 2 × 4 × 7/ 2 × 4 × 6 + 7^2/ 2 × 7 × 6 / $(6)^2$ = 16/ 56 / 97 / 84 / 36 = 226576
(T) $(512)^2 = (5)^2$/ 2 × 5 × 1 / 2 × 5 × 2 + 1^2/ 2 × 1 × 2 / $(2)^2$ = 25 / 10 / 21 / 4 /4 = 262144
(U) $(678)^2 = (6)^2$/ 2 × 6 × 7 / 2 × 6 × 8 + 7^2/ 2 × 7 × 8 / $(8)^2$ = 36 / 84 / 145 / 112 / 64 = 459684
(V) $(2032)^2 = (2)^2$ / 2 × 2 × 0/ 2 × 2 × 3 + 0^2/ 2 (2 × 2 + 0 × 3)/ 2 × 0 × 2 + 3^2/ 2 × 3 × 2 / $(2)^2$ = 4/ 0 / 12 / 8 / 9 / 12/ 4 = 4129024
(W) $(785)^2 = (7)^2$ / 2 × 7 × 8/ 2 × 7 × 5 + 8^2/ 2 × 8 × 5 / $(5)^2$ = 49 / 112 / 126 / 80 / 25 = 615425
(X) $(796)^2 = (7)^2$ / 2 × 7 × 9/ 2 × 7 × 6 + 9^2/ 2 × 9 × 6 / $(6)^2$ = 49/ 126 / 165 / 108 / 36 = 633616
(Y) $(31005)^2 = (3)^2$ / 2 × 3 × 1/ 2 × 3 × 0 + 1^2/ 2 × [3 × 0 + 1 × 0]/ 2 × 3 × 5 + 2 × 1 × 0 + 0^2/ 2 × [1 × 5 + 0 × 0]/ 2 × 0 × 5 + 0^2/ 2 × 0 × 5/ $(5)^2$ = 9/ 6 / 1/ 0 / 30/ 10 / 0 / 0 / 25 = 961310025
(Z) $(10005)^2 = (1)^2$ / 2 × 1 × 0/ 2 × 1 × 0 + 0^2/ 2 × [1

$\times 0 + 0 \times 0]/\ 2 \times 1 \times 5 + 0 \times 0 + 0^2/\ 2 \times [0 \times 5 + 0 \times 0]/\ 2 \times 0 \times 5 + 0^2/\ 2 \times 0 \times 5/\ (5)^2$
$= 1/\ 0\ /\ 0/\ 0\ /\ 10/\ 0\ /\ 0\ /\ 0\ /\ 25\ = 100100025$

22. I $\sqrt{45} = \sqrt{3 \times 3 \times 5} = 3\sqrt{5}$

II. $\sqrt{220} = \sqrt{2 \times 2 \times 5 \times 11} = 2\sqrt{55}$

III. $\sqrt{180} = \sqrt{6 \times 6 \times 3} = 6\sqrt{3}$

IV. $\sqrt{385} = \sqrt{5 \times 7 \times 11}$

V. $\sqrt{9801} = \sqrt{99 \times 99} = 99$

VI. $\sqrt{69696} = \sqrt{4 \times 4 \times 2 \times 2 \times 33 \times 33} = 264$

VII. $\sqrt{7744} = \sqrt{4 \times 4 \times 2 \times 2 \times 11 \times 11} = 88$

VIII. $\sqrt{30976} = \sqrt{4 \times 4 \times 4 \times 4 \times 11 \times 11} = 176$

IX. $\sqrt{47089} = \sqrt{7 \times 7 \times 31 \times 31} = 217$

X. $\sqrt{26569} = \sqrt{163 \times 163} = 163$

23. (B) $\sqrt{4444355556} + \sqrt{9999800001} + \sqrt{1111088889} = 66666 + 99999 + 33333$
$= 199998$

24. (B) A) $\sqrt{2149184}$
$= \sqrt{4 \times 4 \times 4 \times 33851} = 8\sqrt{33581}$

B) $\sqrt{2039184}$
$= \sqrt{4 \times 4 \times 9 \times 7 \times 7 \times 17 \times 17}$
$= 1428$

C) $\sqrt{2039186} = \sqrt{2 \times 1019593}$

D) $\sqrt{2039188} = \sqrt{4 \times 509797}$
$= 2\sqrt{509797}$

So, Option B is the only perfect square

25. (C) In these type of questions we will find non-perfect square. Conditions for non-perfect square :-
1. Unit digit must be 2, 3, 7, 8
2. "Digital sum" Should be 2, 3, 5, 6, 8
3. For perfect square last two digit should be equal to "1-24" squares

exa :- 106276 → last two digit are same as $(24)^2 = 576$
So, it is a perfect square
A) 625049 → (digital sum = 8) Non perfect
B) 12549 → (digital sum = 3) Non perfect
C) 135424 → (digital sum = 1) Perfect Square
D) 576828 → (Unit digit = 8) Non perfect

26. (A)

(A) 5535.36 → (last two digits are from 1-24 squares) Perfect square
(B) 3152.88 → (unit digit = 8) non perfect square
(C) 72905.2 → (unit digit = 2) non perfect square
(D) 67508.5 → (last two digit are not from the 1-24 squares) non perfect square.

27. (D)

(A) 5823.82 → (unit digit = 2) non perfect
(B) 22504.9 → (only one digit after decimal) non perfect
(C) 2460.14 → (digital sum = 8) non perfect
(D) 1489.96 → (last two digit same as $14^2 = 96$) perfect squares

28. (C)
(A) 1250.49 (digital sum = 3) non perfect
(B) 6250.49 (digital sum = 8) non perfect
(D) 5768.28 (unit digit = 8) non perfect
So, option C is a perfect square

29. (A)
(B) 1252.49 (digital sum = 5) non perfect
(C) 7268.54 (digital sum = 5) non perfect
(D) 62504.9 (digital sum = 8) non perfect
So, option A will be perfect square.

30. (C)
(A) 3497497 (unit digit = 7) non perfect
(B) 4587632 (digital sum = 8) non perfect
(D) 1034758 (unit digit = 8) non perfect
So, option C will be perfect square.

31. (A)

	95
9	8958
	81
185	858
	925

So Required number = 925 – 858 = 67

32. (C)

	961
9	923604
	81
186	1136
	1116
1921	2004
	1921

So, Required number = 2004 – 1921 = 83

33. (C)

	622
6	386822
	36
122	268
	244
1242	2422
	2484

So, Required number = 2484 – 2422 = 62

34. (A) As we know,
Square of an even number must be divisible by 4 and square of an odd number must be an odd number.
ATQ, n^2 = ...54
And 54 is not divisible by 4
So, there are no such values of n

35. (B) As we know,
For a perfect square tens place digit must be an even number except number ending with 6.
ATQ,
It ab 7n is a perfect square then n must be 6
So, Total possible values of n is 1
[ab7n = 5776 = 76^2]

36. (D) If AABB is a perfect square number then It is only possible for $(88)^2 = 7744 = AABB$
So, A = 7, B = 4
$\Rightarrow$ A – B = 3

37. (C) $x + a(a + 2) = x + a^2 + 2a = a^2 + 2a + 1$
$\Rightarrow$ x = 1

38. (C) $\sqrt{23 \times 24 \times 25 \times 26 + 1}$
Let 23 = a
$\Rightarrow \sqrt{a \times (a+1) \times (a+2) \times (a+3) + 1}$
$\Rightarrow \sqrt{(a^2 + 3a)(a^2 + 3a + 2) + 1}$
Let $a^2 + 3a = P$
$\Rightarrow \sqrt{P(P+2)+1} = \sqrt{(P+1)^2} = P + 1$
$= a^2 + 3a + 1 = 23^2 + 3 \times 23 + 1$
$= 23^2 + 2 \times 23 + 1 + 23 = 599$
It is a rational integer number

39. (D) ATQ, $x^2 - y^2 = 96$
$\Rightarrow (x+y)(x-y)$ = 1×96, 2×48, 3×32, 4×24, 6×16, 8×12
If one factor is even and another is odd then numbers can't be integer.
So, total possible pairs = 4

40. (A) ATQ, $x^2 - y^2 = 101 = 101 \times 1$
So, Total possible pairs = 1

41. (A) $3335 \times 3337 = (3336 - 1)(3336 + 1) = 3336^2 - (1)^2$
So, To get perfect square we will add 1

42. (B) $6561 \times 6565 = (6563 - 2)(6563 + 2) = 6563^2 - 2^2$
So, To get perfect square we will add 4

43. (C) $6541 \times 6542 = (6542 - 1)(6542) = 6542^2 - 6542$
So, To get perfect square we add 6542

44. (A) $3011 \times 3012 = 3011 \times (3011 + 1) = 3011^2 + 3011$
So, To get perfect square we will substraet 3011

45. (B) $N = (12345)^2 + 12345 + 12346$
$= (12345)^2 + 12345 + 12345 + 1$
$= (12345)^2 + 2 \times 12345 + (1)^2$
$= (12345 + 1)^2 = (12346)^2$
$= \sqrt{N} = 12346$

46. (A) $(17)^3 = 4913$
(B) $(13)^3 = 2194$
(C) $(21)^3 = 9261$
(D) $(51)^3 = 132651$
(E) $(33)^3 = 35937$
(F) $(66)^3 = 287496$
(G) $(42)^3 = 74088$
(H) $(34)^3 = 39304$
(I) $(104)^3 = 1124864$
(J) $(119)^3 = 1685159$

47. (A) $\sqrt[3]{1728} = 12$
(B) $\sqrt[3]{226981} = 61$
(C) $\sqrt[3]{4251528} = 162$
(D) $\sqrt[3]{438976} = 76$
(E) $\sqrt[3]{3241792} = 148$
(F) $\sqrt[3]{238328} = 62$

48. (B) Total Required numbers = $\frac{\sqrt[3]{129999}}{5} - \frac{\sqrt[3]{1000}}{5}$
$= \frac{50}{5} - \frac{10}{5} = 8$

49. (C) ATQ, For perfect cube last 3 digits should be 0 in this question
So, 15625000 is perfect cube.

50. (B)

51. (B) $2 + \sqrt{3} - \left(5 + \sqrt{3}\right) + \frac{\sqrt{11}}{3 + \sqrt{11} + \left(\sqrt{11} - 3\right)}$
$\Rightarrow -3 + \frac{1}{2} \quad \Rightarrow \quad -2\frac{1}{2}$

52. (C)

53. (C) $\sqrt{3^{34} + 3^{35}}$
$= \sqrt{3^{34}(1+3)} = \sqrt{4\left(3^{34}\right)} = \sqrt{2 \times 2 \times 3^{17} \times 3^{17}}$
$= 2 \times 3^{17}$