Chapter-wise SSC Solved Papers - Sample Chapters

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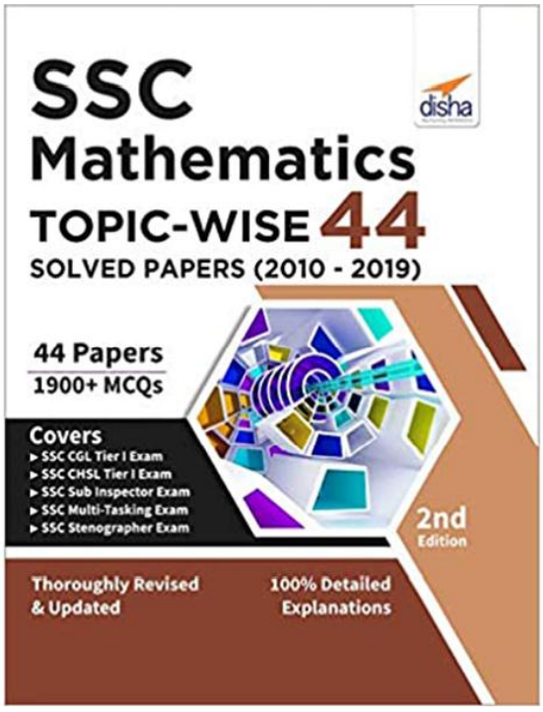

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CHAPTER 2 SIMPLIFICATION AND SQUARE & CUBE ROOT

1. $\frac{0.125+0.027}{0.25-0.15+0.09}$ is equal to **(SSC CGL 1st Sit. 2010)**

(a) 0.3 (b) 0.5 (c) 0.8 (d) 0.9

2. The sum of the series $(1+0.6+0.06+0.006+0.0006+....)$ is **(SSC CGL 1st Sit. 2010)**

(a) $1\frac{2}{3}$ (b) $1\frac{1}{3}$ (c) $2\frac{1}{3}$ (d) $2\frac{2}{3}$

3. $\sqrt{\frac{0.009\times0.036\times0.016\times0.08}{0.002\times0.0008\times0.0002}}$ is equal to **(SSC CGL 1st Sit. 2010)**

(a) 34 (b) 36 (c) 38 (d) 39

4. The square root of 0.09 is **(SSC CGL 1st Sit. 2010)**

(a) 0.30 (b) 0.03 (c) 0.81 (d) 0.081

5. The number 0.121212.... in the form $\frac{p}{q}$ is equal to **(SSC CGL 1st Sit. 2010)**

(a) $\frac{4}{11}$ (b) $\frac{2}{11}$ (c) $\frac{4}{33}$ (d) $\frac{2}{33}$

6. By what least number should 675 be multiplied so as to obtain a perfect cube number ? **(SSC CGL 2nd Sit. 2010)**

(a) 3 (b) 5 (c) 24 (d) 40

7. $\left(1\frac{1}{2}+11\frac{1}{2}+111\frac{1}{2}+1111\frac{1}{2}\right)$ is equal to **(SSC CGL 2nd Sit. 2010)**

(a) 1236 (b) $1234\frac{1}{2}$ (c) 618 (d) 617

8. $0.\overline{001}$ is equal to **(SSC CGL 2nd Sit. 2010)**

(a) $\frac{1}{1000}$ (b) $\frac{1}{999}$ (c) $\frac{1}{99}$ (d) $\frac{1}{9}$

9. $\frac{4.41\times0.16}{2.1\times1.6\times0.21}$ is simplified to **(SSC CGL 2nd Sit. 2010)**

(a) 1 (b) 0.1 (c) 0.01 (d) 10

10. $\frac{256\times256-144\times144}{112}$ is equal to **(SSC CGL 2nd Sit. 2010)**

(a) 420 (b) 400 (c) 360 (d) 320

11. $(1^2+2^2+3^2+.....+10^2)$ is equal to **(SSC CGL 2nd Sit. 2010)**

(a) 380 (b) 385 (c) 390 (d) 392

12. $\left(1-\frac{1}{3}\right)\left(1-\frac{1}{4}\right)\left(1-\frac{1}{5}\right)....\left(1-\frac{1}{25}\right)$ is equal to **(SSC CGL 2nd Sit. 2010)**

(a) $\frac{2}{25}$ (b) $\frac{1}{25}$

(c) $1\frac{19}{25}$ (d) $\frac{1}{325}$

13. Simplified form of $\left[\left(\sqrt[5]{x^{\frac{-3}{5}}}\right)^{-5/3}\right]^5$ is **(SSC CGL 2nd Sit. 2010)**

(a) x^5 (b) x^{-5} (c) x (d) $\frac{1}{x}$

14. $(0.1\times0.01\times0.001\times10^7)$ is equal to **(SSC CGL 2nd Sit. 2010)**

(a) 100 (b) $\frac{1}{10}$ (c) $\frac{1}{100}$ (d) 10

15. The least among the fractions $\frac{15}{16},\frac{19}{20},\frac{24}{25},\frac{34}{35}$ is **(SSC CGL 2nd Sit. 2010)**

(a) $\frac{34}{35}$ (b) $\frac{15}{16}$ (c) $\frac{19}{20}$ (d) $\frac{24}{25}$

16. $1.\overline{27}$ in the form $\frac{p}{q}$ is equal to **(SSC CGL 2st Sit. 2010)**

(a) $\frac{127}{100}$ (b) $\frac{73}{100}$ (c) $\frac{14}{11}$ (d) $\frac{11}{14}$

17. $\frac{3.25\times3.20-3.20\times3.05}{0.064}$ is equal to **(SSC CGL 2nd Sit. 2010)**

(a) 1 (b) $\frac{1}{2}$ (c) $\frac{1}{10}$ (d) 10

18. Out of six consecutive natural numbers, if the sum of first three is 27, what is the sum of the other three ? **(SSC CGL 2nd Sit. 2010)**

(a) 36 (b) 35 (c) 25 (d) 24

19. $\left\{\frac{(0.1)^2-(0.01)^2}{0.0001}+1\right\}$ is equal to **(SSC CGL 2nd Sit. 2010)**

(a) 1010 (b) 110 (c) 101 (d) 100

20. $\sqrt{6+\sqrt{6+\sqrt{6+\sqrt{6+...}}}}=?$ **(SSC CGL 1st Sit. 2011)**

(a) 2.3 (b) 3 (c) 6 (d) 6.3

21. The square root of $\left(\frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}\right)$ is **(SSC CGL 1st Sit. 2011)**

(a) $\sqrt{3}+\sqrt{2}$ (b) $\sqrt{3}-\sqrt{2}$

(c) $\sqrt{2}\pm\sqrt{3}$ (d) $\sqrt{2}-\sqrt{3}$

22. The value of $\frac{2\frac{1}{3}-1\frac{2}{11}}{3+\frac{1}{3+\frac{1}{3+\frac{1}{3}}}}$ is **(SSC CGL 1st Sit. 2011)**

(a) $\frac{38}{109}$ (b) $\frac{109}{38}$ (c) 1 (d) $\frac{116}{109}$

23. The value of $\frac{3\sqrt{2}}{\sqrt{3}+\sqrt{6}}-\frac{4\sqrt{3}}{\sqrt{6}+\sqrt{2}}+\frac{\sqrt{6}}{\sqrt{3}+\sqrt{2}}$ is **(SSC CGL 2011)**

(a) 4 (b) 0 (c) $\sqrt{2}$ (d) $3\sqrt{6}$

24. $\frac{(0.05)^2+(0.41)^2+(0.073)^2}{(0.005)^2+(0.041)^2+(0.0073)^2}$ is **(SSC CGL 2011)**

(a) 10 (b) 100

(c) 1000 (d) None of these

25. If $9\sqrt{x}=\sqrt{12}+\sqrt{147}$, then x = ? **(SSC CGL 2011)**

(a) 2 (b) 3 (c) 4 (d) 5

26. $\sqrt[3]{1-\frac{127}{343}}$ is equal to **(SSC CGL 2nd Sit. 2011)**

(a) $\frac{5}{9}$ (b) $1-\frac{1}{7}$ (c) $\frac{4}{7}$ (d) $1-\frac{2}{7}$

27. If the sum of two numbers be multiplied by each number separately, the products so obtained are 247 and 114. The sum of the numbers is **(SSC CGL 2nd Sit. 2011)**

(a) 19 (b) 20 (c) 21 (d) 23

28. Find a number, one–seventh of which exceeds its eleventh part by 100. **(SSC CGL 2nd Sit. 2011)**

(a) 1925 (b) 1825 (c) 1540 (d) 1340

29. If $\frac{4\sqrt{3}+5\sqrt{2}}{\sqrt{48}+\sqrt{18}}=a+b\sqrt{6}$, then the values of a and b are respectively **(SSC CGL 2nd Sit. 2011)**

(a) $\frac{9}{15},-\frac{4}{15}$ (b) $\frac{3}{11},\frac{4}{33}$

(c) $\frac{9}{10},\frac{2}{5}$ (d) $\frac{3}{5},\frac{4}{15}$

30. If $x+\frac{2}{3+\frac{4}{5+\frac{7}{6}}}=10$, then the value of x is **(SSC CGL 2nd Sit. 2011)**

(a) $\frac{1276}{135}$ (b) $\frac{53}{6}$ (c) 4.35 (d) 9

31. The value of $3+\frac{1}{\sqrt{3}}+\frac{1}{3+\sqrt{3}}+\frac{1}{\sqrt{3}-3}$ is **(SSC CGL 2nd Sit. 2011)**

(a) $3+\sqrt{3}$ (b) 3 (c) 1 (d) 0

32. A student was asked to divide a number by 6 and add 12 to the quotient. He, however, first added 12 to the number and then divided it by 6, getting 112 as the answer. The correct answer should have been **(SSC CGL 2nd Sit. 2011)**

(a) 124 (b) 122 (c) 118 (d) 114

33. Last year my age was a perfect square number. Next year it will be a cubic number. What is my present age? **(SSC Sub. Ins. 2012)**

(a) 25 years (b) 27 yearss

(c) 26 years (d) 24 years

34. What is the value of $(2.1)^2\times\sqrt{0.0441}$? **(SSC Sub. Ins. 2012)**

(a) 0.9261 (b) 92.61 (c) 92.51 (d) 0.9251

35. The value of $\sqrt[3]{1372}\times\sqrt[3]{1458}$ is **(SSC Sub. Ins. 2012)**

(a) 116 (b) 126 (c) 106 (d) 136

36. If $\frac{547.527}{0.0082}=x$, then the value $\frac{547527}{82}$ is : **(SSC CHSL 2012)**

(a) 10x (b) 100x (c) $\frac{x}{100}$ (d) $\frac{x}{10}$

37. If $\sqrt[3]{3^n}=27$, then the value of n is: **(SSC CHSL 2012)**

(a) 9 (b) 6 (c) 1 (d) 3

38. From 9.00 AM to 2.00 PM, the temperature rose at a constant rate from 21°C to 36°C. What was the temperature at noon ? **(SSC CHSL 2012)**

(a) 27°C (b) 30°C (c) 32°C (d) 28.5°C

39. The value of $\left(\sqrt{6+\sqrt{6+\sqrt{6+.....upto...\infty}}}\right)$ is equal to **(SSC CGL 1st Sit. 2012)**

(a) 3 (b) 10 (c) 8 (d) 2

40. If $\sqrt{6}\times\sqrt{15}=x\sqrt{10}$, then the value of x is **(SSC CGL 2012)**

(a) 3 (b) ± 3 (c) $\sqrt{3}$ (d) $\sqrt{6}$

41. $3-\frac{3+\sqrt{5}}{4}-\frac{1}{3+\sqrt{5}}$ is equal to **(SSC CGL 2012)**

(a) 0 (b) $\frac{3}{2}$ (c) $\frac{\sqrt{5}}{2}$ (d) $\sqrt{5}$

42. A farmer divides his herd of n cows among his four sons, so that the first son gets one–half the herd, the second one–fourth, the third son $\frac{1}{5}$ and the fourth son 7 cows. Then the value of n is **(SSC CGL 2012)**

(a) 240 (b) 100 (c) 180 (d) 140

43. By what least number should 675 be multiplied to obtain a number which is a perfect cube? **(SSC CGL 2012)**

(a) 7 (b) 8 (c) 5 (d) 6

44. If $2\sqrt{x}=\frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}}-\frac{\sqrt{5}-\sqrt{3}}{\sqrt{5}+\sqrt{3}}$, then the value of x is: **(SSC CGL 2nd Sit. 2012)**

(a) 6 (b) 30 (c) $\sqrt{15}$ (d) 15

45. $\frac{1+876542\times 876544}{876543\times 876543}$ is equal to **(SSC CGL 2012)**

(a) 3 (b) 0 (c) 1 (d) 2

46. The simplest value of

$\frac{1}{\sqrt{2}+\sqrt{3}}+\frac{1}{\sqrt{3}+\sqrt{4}}+\frac{1}{\sqrt{4}+\sqrt{5}}+\frac{1}{\sqrt{5}+\sqrt{6}}$ is **(SSC CGL 2012)**

(a) $\sqrt{3}\left(\sqrt{2}-1\right)$ (b) $\sqrt{2}\sqrt{3}-1)$

(d) $\sqrt{3}-1$ (d) $\sqrt{2}-1$

47. If 21 is added to a number, it becomes 7 less than thrice of the number. Then the number is **(SSC CGL 2012)**

(a) 14 (b) 161 (c) 18 (d) 19

48. The simplified value of $\frac{\sqrt{32}+\sqrt{48}}{\sqrt{8}+\sqrt{12}}$ is **(SSC Multitasking 2013)**

(a) 4 (b) 3 (c) 2 (d) 6

49. $\sqrt{\frac{9.5\times 0.085}{0.0017\times 0.19}}$ equals **(SSC Multitasking 2013)**

(a) 5 (b) 50 (c) 500 (d) 0.05

50. The value of $1+\frac{1}{1+\frac{2}{3+\frac{4}{5}}}$ is: **(SSC Sub. Ins. 2013)**

(a) $\frac{12}{29}$ (b) $\frac{8}{19}$ (c) $\frac{48}{29}$ (d) $\frac{2}{19}$

HINTS & SOLUTIONS

1. (c) If $0.5 = a$ and $0.3 = b$ then,

$$\text{Expression} = \frac{a^3 + b^3}{a^2 - ab + b^2}$$

$$= \frac{(a+b)(a^2 - ab + b^2)}{a^2 - ab + b^2} = a + b = 0.5 + 0.3 = 0.8$$

2. (a) $1 + 0.6 + 0.06 + 0.006 + 0.0006 + ... = 1.666...$

$$= 1.\bar{6} = 1\frac{6}{9} = 1\frac{2}{3}$$

3. (b) Expression

$$= \sqrt{\frac{0.009 \times 0.036 \times 0.016 \times 0.08}{0.002 \times 0.0008 \times 0.0002}} = \sqrt{\frac{9 \times 32 \times 16 \times 8}{2 \times 8 \times 2}}$$

$$= 3 \times 2 \times 3 \times 2 = 36$$

4. (a) $\sqrt{0.09} = \sqrt{0.3 \times 0.3} = 0.3$

5. (c) $0.121212.... = 0.\overline{12} = \frac{12}{99} = \frac{4}{33}$

6. (b) $675 = 5 \times 5 \times 3 \times 3 \times 3 = 5$

No. to be multiplied

7. (a) $1\frac{1}{2} + 11\frac{1}{2} + 111\frac{1}{2} + 1111\frac{1}{2} = 1234 + 2 = 1236$

8. (b) $0.\overline{001} = \frac{1}{999}$

9. (a) $\frac{4.41 \times 0.16}{2.1 \times 1.6 \times 0.21} = \frac{441 \times 16}{21 \times 16 \times 21} = 1$

10. (b) If $256 = a$ and $144 = b$, then

$$\frac{a^2 - b^2}{a - b}$$

$[a - b = 256 - 144 = 112]$

$$= \frac{(a+b)(a-b)}{(a-b)} = a + b = 256 + 144 = 400$$

11. (b) $1^2 + 2^2 + 3^2 + ... + n^2 = \frac{n(n+1)((2n+1)}{6}$

$$\therefore 1^2 + 2^2 + 3^2 + ... + 10^2 = \frac{10(10+1)(20+1)}{6} = 385$$

12. (a) $\left(1 - \frac{1}{3}\right)\left(1 - \frac{1}{4}\right)\left(1 - \frac{1}{5}\right).... \left(1 - \frac{1}{24}\right)\left(1 - \frac{1}{25}\right)$

$$= \frac{2}{3} \times \frac{3}{4} \times \frac{4}{5} ..... \times \frac{23}{24} \times \frac{24}{25} = \frac{2}{25}$$

13. (c) $\left[\left(\sqrt[5]{x^{-3/5}}\right)^{\frac{-5}{3}}\right]^5 = \left(x^{-\frac{3}{5}}\right)^{\frac{1}{5} \times \frac{-5}{3} \times 5} = x^{-\frac{3}{5} \times \frac{-5}{3}} = x$

14. (d) $0.1 \times 0.01 \times 0.001 \times 10^7 = 10^{-6} \times 10^7 = 10$

15. (b) $\frac{15}{16} = 0.94$; $\frac{19}{20} = 0.95$

$\frac{24}{25} = 0.96$; $\frac{34}{35} = 0.97$

16. (c) $1.\overline{27} = 1\frac{27}{99} = 1\frac{3}{11} = \frac{14}{11}$

17. (d) $\frac{3.20(3.25 - 3.05)}{0.064}$

$$= \frac{3.20 \times 0.20}{0.064} = 10$$

18. (a) $8 + 9 + 10 = 27$

$11 + 12 + 13 = 36$

So, let 3 consecutive no x, x + 1, x + 2

Next 3 consecutive no x + 3; x + 4, x + 5

i.e. sum of last 3 consecutive no. is 9 more than sum of first 3.

$= 27 + 9 = 36$

19. (d) $\frac{0.01 - 0.0001}{0.0001} + 1 = \frac{0.0099}{0.0001} + 1 = 99 + 1 = 100$

20. (b) $\sqrt{6 + \sqrt{6 + \sqrt{6.....}}} = x$

$6 = 3 \times 2$

By trick = 3 answer

21. (a) $\text{Expression} = \frac{(\sqrt{3} + \sqrt{2})}{(\sqrt{3} - \sqrt{2})}$

Rationalising the denominator,

$$\frac{(\sqrt{3} + \sqrt{2})(\sqrt{3} + \sqrt{2})}{(\sqrt{3} - \sqrt{2})(\sqrt{3} + \sqrt{2})} = \frac{(\sqrt{3} + \sqrt{2})^2}{3 - 2} = (\sqrt{3} + \sqrt{2})^2$$

$$\therefore \sqrt{\frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}}} = \sqrt{(\sqrt{3} + \sqrt{2})^2} = \sqrt{3} + \sqrt{2}$$

22. (a) Expression

$$= \frac{\frac{7}{3} - \frac{13}{11}}{3 + \frac{1}{3 + \frac{1}{\frac{9+1}{3}}}} = \frac{\frac{77 - 39}{33}}{3 + \frac{1}{3 + \frac{3}{10}}}$$

$$= \frac{\frac{38}{33}}{3+\frac{1}{\frac{30+3}{10}}} = \frac{\frac{38}{33}}{3+\frac{10}{33}} = \frac{\frac{38}{33}}{\frac{99+10}{33}} = \frac{38}{33}\times\frac{33}{109} = \frac{38}{109}$$

23. (b) Expression

$$= \frac{3\sqrt{2}}{\sqrt{3}+\sqrt{6}} - \frac{4\sqrt{3}}{\sqrt{6}+\sqrt{2}} + \frac{\sqrt{6}}{\sqrt{3}+\sqrt{2}}$$

$$= \frac{3\sqrt{2}(\sqrt{6}-\sqrt{3})}{(\sqrt{6}+\sqrt{3})(\sqrt{6}-\sqrt{3})} - \frac{4\sqrt{3}(\sqrt{6}-\sqrt{2})}{(\sqrt{6}+\sqrt{2})(\sqrt{6}-\sqrt{2})} + \frac{\sqrt{6}}{(\sqrt{3}+\sqrt{2})}\times\frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}-\sqrt{2}}$$

$$= \frac{3\sqrt{2}(\sqrt{6}-\sqrt{3})}{(6-3)} - \frac{4\sqrt{3}(\sqrt{6}-\sqrt{2})}{(6-2)} + \frac{\sqrt{6}(\sqrt{3}-\sqrt{2})}{(3-2)}$$

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

$$= \sqrt{12}-\sqrt{6}-\sqrt{18}+\sqrt{6}+\sqrt{18}-\sqrt{12} = 0$$

24. (b) $\dfrac{(0.05)^2+(0.41)^2+(0.073)^2}{(0.005)^2+(0.041)^2+(0.0003)^2}$

$$\frac{(0.05)^2+(0.41)^2+(0.073)^2}{\frac{1}{100}(0.05)^2+(0.41)^2+(0.073)^2} = 100$$

25. (b) $9\sqrt{x} = \sqrt{3\times2\times2}+\sqrt{3\times7\times7}$

$\Rightarrow 9\sqrt{x} = 2\sqrt{3}+7\sqrt{3} = 9\sqrt{3}$

$\therefore\ x = 3$

26. (b) $\sqrt[3]{1-\frac{127}{343}} = \sqrt[3]{\frac{343-127}{343}}$

$$= \sqrt[3]{\frac{216}{343}} = \sqrt[3]{\frac{(6)^3}{(7)^3}} = \frac{6}{7} = 1-\frac{1}{7}$$

27. (a) Let the numbers be x and y.

$\therefore x(x+y) = 247$

and $y(x+y) = 114$

$\Rightarrow x^2+xy = 247$ and $xy+y^2 = 114$

On adding;

$x^2+xy+xy+y^2 = 247+114$

$\Rightarrow x^2+2xy+y^2 = 361$

$\Rightarrow (x+y)^2 = 19^2 \Rightarrow x+y = 19$

28. (a) Let the number be x.

$$\therefore\ \frac{x}{7}-\frac{x}{11} = 100$$

$$\Rightarrow \frac{11x-7x}{11\times7} = 100$$

$\Rightarrow 4x = 77\times100$

$\Rightarrow x = \dfrac{77\times100}{4} = 1925$

29. (d) $\dfrac{4\sqrt{3}+5\sqrt{2}}{\sqrt{48}+\sqrt{18}}$

$\Rightarrow \dfrac{4\sqrt{3}+3\sqrt{2}+2\sqrt{2}}{4\sqrt{3}+3\sqrt{2}} \Rightarrow \dfrac{1+2\sqrt{2}}{4\sqrt{3}+3\sqrt{2}}$

By Rationalising

$$\frac{1+2\sqrt{2}(4\sqrt{3}-3\sqrt{2})}{(4\sqrt{3}+3\sqrt{2})(4\sqrt{3}-3\sqrt{2})}$$

$$\frac{1+8\sqrt{6}-12}{48-18},\ \frac{1+8\sqrt{6}-12}{30},\ \frac{30-12+8\sqrt{6}}{30}$$

$$\frac{18}{30}+\frac{18}{30}\sqrt{6} = a+b\sqrt{6}$$

$$\frac{3}{5}+\frac{4}{15}\sqrt{6} = a+b\sqrt{6}$$

$$a = \frac{3}{5},\quad b = \frac{4}{15}$$

30. (a) $x+\dfrac{2}{3+\frac{4}{\frac{30+7}{6}}} = 10$

$$\Rightarrow x+\frac{2}{3+\frac{4\times6}{37}}$$

$$\Rightarrow x+\frac{2}{3+\frac{24}{37}} = 10$$

$$\Rightarrow x+\frac{2}{\frac{111+24}{37}} = 10$$

$$\Rightarrow x+\frac{2\times37}{135} = 10$$

$$\Rightarrow x+\frac{74}{135} = 10$$

$$\Rightarrow x = 10-\frac{74}{135} = \frac{1350-74}{135} = \frac{1276}{135}$$

31. (b) $3+\dfrac{1}{\sqrt{3}}+\left(\dfrac{1}{3+\sqrt{3}}-\dfrac{1}{3-\sqrt{3}}\right)$

$$= 3+\frac{1}{\sqrt{3}}+\left(\frac{3-\sqrt{3}-3-\sqrt{3}}{(3+\sqrt{3})(3-\sqrt{3})}\right)$$

$= 3 + \frac{1}{\sqrt{3}} + \frac{-2\sqrt{3}}{9-3} = 3 + \frac{1}{\sqrt{3}} - \frac{\sqrt{3}}{3} = 3 + \frac{1}{\sqrt{3}} - \frac{1}{\sqrt{3}} = 3$

32. (b) Let the number be x

$\therefore \frac{x+12}{6} = 112$

$\Rightarrow x + 12 = 672$

$\Rightarrow x = 672 - 12 = 660$

$\therefore$ Correct answer $= \frac{660}{6} + 12 = 110 + 12 = 122$

33. (c) By going options, 26 years is the present age. Present age be 26, then last year age was 25 which represents a perfect square and next year age would be 27 which represents a cubic number.

34. (a) Expression is $(2.1)^2 \times \sqrt{0.0441} = 4.41 \times 0.21 = 0.9261$

35. (b) $\sqrt[3]{1372} \times \sqrt[3]{1458}$

$= 7\sqrt[3]{4} \times 9\sqrt[3]{2} = 63 \times \sqrt[3]{4 \times 2} = 63 \times 2 = 126$

36. (d) $\frac{547.527}{0.0082} = x \Rightarrow \frac{547527}{1000} \times \frac{10000}{82} = x$

$\Rightarrow \frac{547527}{82} = \frac{x \times 1000}{10000} \Rightarrow \frac{x}{10}$

37. (a) $\left[3^n\right]^{\frac{1}{3}} = 27$

$\Rightarrow \quad 3^{\frac{n}{3}} = 3^3$

Comparing, $\frac{n}{3} = 3$

$x = 9$

38. (b) Time difference between 9.00 A.M & 2.00 P.M = 5 hours
Temperature difference between 21°C & 36°C
$= 36 - 21 = 15°C$
Now, Time difference between 9.00 A.M & 12.00 Noon $= 3$ hrs.

In 5 hours $\xrightarrow[\text{difference}]{\text{temperature}} 15°C$

So, In 3 hours $\xrightarrow[\text{difference}]{\text{temperature}} \left(\frac{15}{5} \times 3\right) = 9°C$

So, temperature at noon $= 21 + 9 = 30°C$

39. (a) $x = \sqrt{6 + \sqrt{6 + \sqrt{6 + ...\infty}}}$

On squaring,

$x^2 = 6 + \sqrt{6 + \sqrt{6 + ...\infty}}$

$\Rightarrow x^2 = 6 + x$

$\Rightarrow x^2 - x - 6 = 0$

$\Rightarrow x^2 - 3x + 2x - 6 = 0$

$\Rightarrow x(x-3) + 2(x-3) = 0$

$\Rightarrow (x-3)(x+2) = 0$

$\Rightarrow x = 3$ because $x \neq -2$

By trick $3 \times 2 = 6$

40. (a) $\sqrt{6} \times \sqrt{15} = x\sqrt{10}$

$\Rightarrow \sqrt{2 \times 3} \times \sqrt{3 \times 5} = x\sqrt{10}$

$\Rightarrow \sqrt{2} \times \sqrt{5} \times 3 = x\sqrt{10}$

$\Rightarrow 3\sqrt{10} = x\sqrt{10}$

$\Rightarrow x = 3$

41. (b) $\frac{1}{3+\sqrt{5}} = \frac{3-\sqrt{5}}{(3+\sqrt{5})(3-\sqrt{5})}$

$= \frac{3-\sqrt{5}}{9-5} = \frac{3-\sqrt{5}}{4}$

$\therefore 3 - \frac{3+\sqrt{5}}{4} - \frac{3-\sqrt{5}}{4}$

$= \frac{12-3-\sqrt{5}-3+\sqrt{5}}{4} = \frac{6}{4} = \frac{3}{2}$

42. (d) According to the question,

$\frac{n}{2} + \frac{n}{4} + \frac{n}{5} + 7 = n$

$\Rightarrow \frac{10n + 5n + 4n}{20} + 7 = n$

$\Rightarrow \frac{19n}{20} + 7 = n \Rightarrow n - \frac{19n}{20} = 7$

$\Rightarrow \frac{n}{20} = 7 \Rightarrow n = 20 \times 7 = 140$

43. (c) $675 = 5 \times 5 \times 3 \times 3 \times 3$
$= 3^3 \times 5^2$
$\therefore$ Required number $= 5$

44. (d) $2\sqrt{x} = \frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}} - \frac{\sqrt{5}-\sqrt{3}}{\sqrt{5}+\sqrt{3}}$

$= \frac{(\sqrt{5}+\sqrt{3})^2 - (\sqrt{5}-\sqrt{3})^2}{(\sqrt{5}-\sqrt{3})(\sqrt{5}+\sqrt{3})} = \frac{4.\sqrt{5}.\sqrt{3}}{5-3} = 2\sqrt{15}$

$\therefore 2\sqrt{x} = 2\sqrt{15} \Rightarrow x = 15$

45. (c) $\frac{1 + 876542(876542+2)}{(876542+1)^2}$

$= \frac{1 + (876542)^2 + 2 \times 876542}{(876542+1)^2} = \frac{(876542+1)^2}{(876542+1)^2} = 1$

46. (b) $\frac{1}{\sqrt{2}+\sqrt{3}}$

$$= \frac{1}{\sqrt{3}+\sqrt{2}} \times \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}-\sqrt{2}} = \frac{\sqrt{3}-\sqrt{2}}{3-2}$$

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

$$\therefore \frac{1}{\sqrt{4}+\sqrt{3}} = \sqrt{4}-\sqrt{3};$$

$$\frac{1}{\sqrt{4}+\sqrt{5}} = \sqrt{5}-\sqrt{4};$$

$$\frac{1}{\sqrt{5}+\sqrt{6}} = \sqrt{6}-\sqrt{5}$$

$\therefore$ Expression

$$= \sqrt{3}-\sqrt{2}+\sqrt{4}-\sqrt{3}+\sqrt{5}-\sqrt{4}+\sqrt{6}-\sqrt{5}$$

$$= \sqrt{6}-\sqrt{2} = \sqrt{2}\left(\sqrt{3}-1\right)$$

47. (a) If the number be x, then

$x + 21 = 3x - 7$

$\Rightarrow 3x - x = 21 + 7$

$\Rightarrow 2x = 28$

$\Rightarrow x = 14$

48. (c) $\dfrac{\sqrt{32}+\sqrt{48}}{\sqrt{8}+\sqrt{12}} = \dfrac{\sqrt{2\times2\times2\times2\times2}+\sqrt{2\times2\times2\times2\times3}}{\sqrt{2\times2\times2}+\sqrt{2\times2\times3}}$

$$\Rightarrow \frac{4\sqrt{2}+4\sqrt{3}}{2\sqrt{2}+2\sqrt{3}} = \frac{2(2\sqrt{2}+2\sqrt{3})}{(2\sqrt{2}+2\sqrt{3})} = 2$$

49. (b) $\sqrt{\dfrac{9.5\times0.085}{0.0017\times0.19}} = \sqrt{\dfrac{95}{10}\times\dfrac{85}{1000}\times\dfrac{10000}{17}\times\dfrac{100}{19}}$

$\Rightarrow \sqrt{5\times5\times100} = 50$

50. (c) $1+\dfrac{1}{1+\dfrac{2}{\dfrac{15+4}{5}}} = 1+\dfrac{1}{1+\dfrac{2\times5}{19}}$

$$= 1+\frac{1}{\frac{19+10}{19}} = 1+\frac{19}{29} = \frac{29+19}{29} = \frac{48}{29}$$