MATHS

BOOKS - RD SHARMA MATHS (HINGLISH)

EXPONENTS OF REAL NUMBER

Others

1. Prove that : $\frac{a^{-1}}{a^{-1}+b^{-1}}+\frac{a^{-1}}{a^{-1}-b^{-1}}=\frac{2b^2}{b^2-a^2}$

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2. Find the value of x, if $5^{x-3}.3^{2x-8}=225$

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3. Show that : $\left(\frac{x^{a(b-c)}}{x^{b(a-c)}} \cdot \frac{x^b}{x^a}\right)^c = 1$

$$\frac{\left(x^{a+b}\right)^2\left(x^{b+c}\right)\left(x^{c+a}\right)^2}{\left(x^a x^b x^c\right)^4} = 1$$

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4. If $\frac{9^n \times 3^2 \times \left(3^{-\frac{n}{2}}\right)^{-2} - (27)^n}{3^{3m} \times 2^3} = \frac{1}{27}$, Prove that $m - n = 1$.

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5. If $27^x = \frac{9}{3^x}$, find x.

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6. Find the values of x in each of the following : (i) $2^{5x} \div 2^{x} = \left(\sqrt[5]{2}\right)^{20}$ (ii) $\left(2^{3}\right)^{4} = \left(2^{2}\right)^{x}$

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7. Evaluate each of the following: (i) $5^{2} \cdot 5^{4}$ (ii) $5^{8} + 5^{3}$ (iii) $\left(3^{2}\right)^{3}$ (iv) $\left(\frac{11}{12}\right)^{3}$ (v) $\left(\frac{3}{4}\right)^{-3}$

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8. Evaluate each of the following: (i) $\left(\frac{2}{11}\right)^{4} \cdot \left(\frac{11}{3}\right)^{2} \cdot \left(\frac{3}{2}\right)^{3}$ (ii) $\left(\frac{1}{2}\right)^{5} \cdot \left(\frac{-2}{3}\right)^{4} \cdot \left(\frac{3}{5}\right)^{-1}$

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9. If $a = 2$ and $b = 3$, then find the values of each of the following: $a^a + b^b$ (ii) $a^b + b^a$ (iii) a^b (iv) $\left(\frac{a}{b}\right)^a$ (v) $\left(\frac{1}{a} + \frac{1}{b}\right)^a$

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10. Assuming that x, y are positive real numbers, simplify each of the following: (i) $\sqrt{x^{-2}y^3}$ (ii) $\left(x^{-2}y^{-\frac{1}{2}}\right)^2$ (iii) $\left(\sqrt{x^{-3}}\right)^5$

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11. Simplify : $\frac{(25)^{\frac{3}{2}}x(243)^{\frac{3}{5}}}{(16)^{\frac{5}{4}}x(8)^{\frac{4}{3}}}$

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12. Simplify: $\left(\frac{81}{16}\right)^{-\frac{3}{4}} \times \left[\left(\frac{25}{9}\right)^{-\frac{3}{2}} \div \left(\frac{5}{2}\right)^{-3}\right]$

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13. If x, y, z are positive real numbers show that: $\sqrt{x^{-1}y}\sqrt{y^{-1}z}\sqrt{z^{-1}x} = 1$

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14. Evaluate each of the following $5^2 \times 5^4$ (ii) $\left(3^2\right)^3$

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15. Evaluate each of the following

(i) $\left(\frac{11}{12}\right)^3$ (ii) $\left(\frac{3}{4}\right)^{-3}$

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16. Evaluate each of the following:

$(i)\left(\frac{2}{11}\right)^4 \times \left(\frac{11}{3}\right)^2 \times \left(\frac{3}{2}\right)^3$

$(ii)\ \left(\frac{1}{2}\right)^5 \times \left(\frac{-2}{3}\right)^4 \times \left(\frac{3}{5}\right)^{-1}$

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17. Evaluate each of the following: $(i)\ 2^{55} \times 2^{60} - 2^{97} \times 2^{18}$

$(ii)\ \left(\frac{2}{3}\right)^2 \times \left(\frac{2}{5}\right)^{-3} \times \left(\frac{3}{5}\right)^2$

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18. If $a = 2$ and $b = 3$, then find the values of each of the following: $a^a + b^b$ (b)$a^b + b^b$ (c) a^b

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19. If $a = 2$ and $b = 3$, then find the values of each of the following: $\left(\frac{a}{b}\right)^a$ (b) $\left(\frac{1}{a} + \frac{1}{b}\right)^a$

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20. Simplify the following (ii)$\left(3a^4b^3\right)\left(18a^3b^5\right)$ (ii) $\frac{3a^7b^6}{18a^6b^8}$

$\left(\frac{-2a^2}{b^3}\right)^3$

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21. Simplify each of the following: $(a)\ \dfrac{7^n - 3 \times 7^{n+1}}{20 \times 7^n - 2 \times 7^n}$

$(b)\ \dfrac{5^n - 6 \times 5^{n+1}}{9 \times 5^n - 2^2 \times 5^n}$ $(c)\ \dfrac{16 \times 2^{n+1} - 4 \times 2^n}{16 \times 2^{n+2} - 2 \times 2^{n+2}}$

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22. If $\dfrac{9^n \times 3^2 \times \left(3^{-\frac{n}{2}}\right)^{-2} - 27^n}{3^{3m} \times 2^3} = \dfrac{1}{27}$, prove that $m - n = 1$

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23. Assuming that x is a positive real number and a, b, c are rational numbers, show that: $\left(\dfrac{x^b}{x^c}\right)^a \left(\dfrac{x^c}{x^a}\right)^b \left(\dfrac{x^a}{x^b}\right)^c = 1$

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24. Assuming that x is a positive real number and $a,\ b,\ c$ are rational numbers, show that: $\left(\frac{x^a}{x^b}\right)^{\frac{1}{ab}}\left(\frac{x^b}{x^c}\right)^{\frac{1}{bc}}\left(\frac{x^c}{x^a}\right)^{\frac{1}{ac}}=1$

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25. Assuming that x is a positive real number and a, b, c are rational numbers, show that: $\left(\frac{x^a}{x^b}\right)^{a+b}\left(\frac{x^b}{x^c}\right)^{b+c}\left(\frac{x^c}{x^a}\right)^{c+a}=1$

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26. If x is a positive real number and the exponents are rational numbers, show that: $\left(\frac{x^a}{x^b}\right)^{a+b-c}\left(\frac{x^b}{x^c}\right)^{b+c-a}\left(\frac{x^c}{x^a}\right)^{c+a-b}=1$

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27. Show that: $(i)\ \frac{x^{a(b-c)}}{x^{b(a-c)}} \div \left(\frac{x^b}{x^a}\right)^c = 1,$

$(ii)\ \frac{\left(x^{a+b}\right)^2 \left(x^{b+c}\right)^2 \left(x^{c+a}\right)^2}{\left(x^a\, x^b x^c\right)^4} = 1$

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28. Show that:

$$\frac{1}{1+x^{b-a}+x^{c-a}} + \frac{1}{1+x^{a-b}+x^{c-b}} + \frac{1}{1+x^{b-c}+x^{a-c}} = 1$$

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29. If $abc = 1,$ show that

$$\frac{1}{1+a+b^{-1}} + \frac{1}{1+b+c^{-1}} + \frac{1}{1+c+a^{-1}} = 1$$

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30. Prove that: $\frac{a^{-1}}{a^{-1}+b^{-1}}+\frac{a^{-1}}{a^{-1}-b^{-1}}=\frac{2b^2}{b^2-a^2}$

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31. If $a,\ b,\ c$ are distinct positive prime integers such that $a^2b^3c^4=49392,$ find the value of $a,\ b$ and c

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32. Find the value of $x,$ if $5^{x-3}\times 3^{2x-8}=225$

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33. Solve the following equations: $2^{x-5}=256$ (ii) $2^{x+3}=4^{x-1}$

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34. If $9^{x+2} = 720 + 9^x$, find the value of $(4x)^{\frac{1}{x}}$

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35. Solve the equation for x: $2^{2x+1} = 17.\ 2^x - 2^3$

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36. Solve the equation for x $5^{2x+1} = 6.\ 5^x - 1$

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37. $3\left(a^4b^3\right)^{10} \times 5\left(a^2b^2\right)^3$

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38. Simplify that: $\left(2x^{-2}y^{3}\right)^{3}$

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39. Simplify that: $\frac{\left(4 \times 10^{7}\right)\left(6 \times 10^{-5}\right)}{8 \times 10^{4}}$

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40. Simplify that: $\frac{4ab^{2}\left(-5ab^{3}\right)}{10a^{2}b^{2}}$

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41. Simplify that : $\left(\frac{x^{2}\,y^{2}}{a^{2}b^{3}}\right)^{n}$

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42. Simplify that: $\frac{\left(a^{2n-9}\right)^6}{a^{2n-4}}$

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43. If $a=3$ and $b=-2$, find the values of: $(i)\ a^a+b^b$ $(ii)\ a^b+b^a$ $(iii)\ (a+b)^{ab}$

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44. Prove that: $\left(\frac{x^a}{x^b}\right)^{a^2+ab+b^2} \times \left(\frac{x^b}{x^c}\right)^{b^2+bc+c^2} \times \left(\frac{x^c}{x^a}\right)^{c^2+ca+a^2}$

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45. Prove that:

$$\left(\frac{x^a}{x^{-b}}\right)^{a^2-ab+b^2} \times \left(\frac{x^b}{x^{-c}}\right)^{b^2-bc+c^2} \times \left(\frac{x^c}{x^{-a}}\right)^{c^2-ca+a^2} = 1$$

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46. Prove that: $\left(\frac{x^a}{x^b}\right)^c \times \left(\frac{x^b}{x^c}\right)^a \times \left(\frac{x^c}{x^a}\right)^b = 1$

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47. Prove that: $\frac{1}{1+x^{a-b}} + \frac{1}{1+x^{b-a}} = 1$

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48. Prove that:

$$\frac{1}{1+x^{b-a}+x^{c-a}} + \frac{1}{1+x^{a-b}+x^{c-b}} + \frac{1}{1+x^{b-c}+x^{a-c}} = 1$$

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49. Simplify the following: $(i)\ \frac{3^n \times 9^{n+1}}{3^{n-1} \times 9^{n-1}}$,

$(ii)\ \frac{5 \times 25^{n+1} - 25 \times 5^{2n}}{5 \times 5^{2n+3} - (25)^{n+1}}$

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50. Simplify the following: $(i)\ \frac{5^{n+3} - 6 \times 5^{n+1}}{9 \times 5^n - 2^2 \times 5^n}$

$(ii)\ \frac{6(8)^{n+1} + 16(2)^{3n-2}}{10(2)^{3n+1} - 7(8)^n}$

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51. If $49392 = a^4b^2c^3$, find the value of a, b *and* c, where a, b *and* c are different positive primes.

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52. If $1176 = 2^a \times 3^b \times 7^c$, and $a, b \, and \, c$ are natural numbers. find a,b,c.

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53. Given $4725 = 3^a 5^b 7^c$, find the integral values of a, $b \, and \, c$ the value of $2^{-a} 3^b 7^c$

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54. Find the value of: $\left(\frac{8}{27}\right)^{\frac{1}{3}}$

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55. Find the value of : $\left(\frac{32}{243}\right)^{\frac{1}{5}}$

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56. Find the value of: $\left(\frac{1}{64}\right)^{\frac{1}{6}}$

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57. Simplify each of the following: $(i)\ (625)^{-\frac{1}{4}}\ (ii)\ \left(\frac{256}{81}\right)^{\frac{5}{4}}$

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58. Simplify each of the following: $(i)\ \left(\frac{243}{32}\right)^{-\frac{4}{5}}\ (ii)\ (32)^{-\frac{3}{5}}$

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59. $\left[\left\{(625)^{-\frac{1}{4}}\right\}^{-\frac{1}{2}}\right]^{2}$

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60. Simplify: $(256)^{-\left(4^{\left(\frac{-3}{2}\right)}\right)}$

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61. Simplify: $\frac{4}{(216)^{-\frac{2}{3}}}+\frac{1}{(256)^{-\frac{3}{4}}}+\frac{2}{(243)^{-\frac{1}{5}}}$

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62. Simplify: $\sqrt{\frac{1}{4}}+(0.01)^{-\frac{1}{2}}-(27)^{\frac{2}{3}}$

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63. Assuming that x, y, z are positive real numbers, simplify each of the following: $(i)\left(\sqrt{x^{-3}}\right)^{5}$ (ii) $(\sqrt{x})^{-\frac{2}{3}}\sqrt{y^{4}} \div \sqrt{xy^{-\frac{1}{2}}}$

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64. Assuming that x, y, z are positive real numbers, simplify each of the following: $(i)\sqrt[3]{xy^{2}} \div x^{2}y\ (ii)\sqrt[4]{\sqrt[3]{x^{2}}}$

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65. If x, y, z are positive real numbers show that: $\sqrt{x^{-1}y}\sqrt{y^{-1}z}\sqrt{z^{-1}x} = 1$

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66. If $\left(\frac{x^{-1}y^2}{x^3y^{-2}}\right)^1 . \left(\frac{x^6\, y^{-3}}{x^2\, y^3}\right)^{\frac{1}{2}} = x^a y^b$, prove that $a + b = -1$, where x *and* y are different positive primes.

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67. If $x = 28^{\frac{1}{3}}$ and $y = 27^{\frac{1}{3}}$ find the value of $x + y - \frac{1}{x^2 + xy + y^2}$

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68. If $x = 3$, find the value of $\left(x^{\frac{1}{3}} + x^{-\frac{1}{3}}\right)\left(x^{\frac{2}{3}} + x^{-\frac{2}{3}} - 1\right)$

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69. If $25^{n-1} + 100 = 5^{2n-1}$, find the value of n :

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70. Solve the equation for x: $(i)\ 4^{2x} = \frac{1}{32}$

$(ii)\ \sqrt{\left(\frac{3}{5}\right)^{1-2x}} = 4\frac{17}{27}$

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71. Solve the equation for x: $2^3\left(5^0 + 3^{2x}\right) = 8\frac{8}{27}$

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72. Solve the equation: $3(2^x + 1) - 2^{x+2} + 5 = 0$

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73. Solve the equations for $x \; and \; y$

$3^x = 9 \times 3^y, \; 8 \times 2^y = 4^x$

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74. Solve the equation for $x \; and \; y$

$(32)^x \div 2^{y+1} = 1, \; 16^{4-\frac{x}{2}} - 8^y = 0$

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75. If $a^x = b, \; b^y = c \; and \; c^z = a,$ prove that $xyz = 1$

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76. If $a^x = b^y = c^z$ and $b^2 = ac$, prove that $y = \frac{2xz}{x+z}$

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77. Assuming that x, y, z are positive real numbers, simplify each of the following: $(i)\left(\sqrt{x^{-3}}\right)^5$ (ii) $\sqrt{x^{-2}y^3}$ (iii) $\left(x^{-\frac{2}{3}}y^{-\frac{1}{2}}\right)^2$

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78. Assuming that x, y, z are positive real numbers, simplify each of the following: $\left(\sqrt{x}\right)^{-\frac{2}{3}}\sqrt{y^4} \div \sqrt{xy^{-\frac{1}{2}}}$ (ii) $\sqrt[5]{243\,x^{10}y^5z^{10}}$

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79. Assuming that x, y, z are positive real numbers, simplify each of the following: $(i)\left(\frac{x^{-4}}{y^{-10}}\right)^{\frac{5}{4}}$ $(ii)\left(\frac{\sqrt{2}}{\sqrt{3}}\right)^{5}\left(\frac{6}{7}\right)^{2}$

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80. Simplify: $(i)\left(16^{-\frac{1}{5}}\right)^{\frac{5}{2}}$ $(ii)\ (32)^{-\frac{3}{5}}$ $(iii)\ (343)^{-\frac{2}{3}}$

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81. Simplify: $(i)\ (0.001)^{\frac{1}{3}}$ $(ii)\ \frac{(25)^{\frac{3}{2}}\times(243)^{\frac{3}{5}}}{(16)^{\frac{5}{4}}\times(8)^{\frac{4}{3}}}$

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82. Simplify: $(i)\ \left(\frac{\sqrt{2}}{5}\right)^{8} \div \left(\frac{\sqrt{2}}{5}\right)^{13}$

$(ii)\ \left(\frac{5^{-1} \times 7^{2}}{5^{2} \times 7^{-4}}\right)^{\frac{7}{2}} \times \left(\frac{5^{-2} \times 7^{3}}{5^{3} \times 7^{-5}}\right)^{-\frac{5}{2}}$

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83. Prove that:

$$\left(\sqrt{3 \times 5^{-3}} \div \sqrt[3]{3^{-1}}\sqrt{5}\right) \times \left(3 \times 5^{6}\right)^{\frac{1}{6}} = \frac{3}{5}$$

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84. Prove that: $9^{\frac{3}{2}} - 3 \times 5^{0} - \left(\frac{1}{81}\right)^{-\frac{1}{2}} = 15$

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85. Prove that: $\left(\frac{1}{4}\right)^{-2} - 3 \times 8^{\frac{2}{3}} \times 4^{0} + \left(\frac{9}{16}\right)^{-\frac{1}{2}} = \frac{16}{3}$

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86. Prove that: $\frac{2^{\frac{1}{2}} \times 3^{\frac{1}{3}} \times 4^{\frac{1}{4}}}{10^{-\frac{1}{5}} \times 5^{\frac{3}{5}}} \div \frac{3^{\frac{4}{3}} \times 5^{-\frac{7}{5}}}{4^{-\frac{3}{5}} \times 6} = 10$

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87. Prove that: $(i)\ \sqrt{\frac{1}{4}} + (0.01)^{-\frac{1}{2}} - (27)^{\frac{2}{3}} = \frac{3}{2}$

$(ii)\ \frac{2^{n} + 2^{n-1}}{2^{n+1} - 2^{n}} = \frac{3}{2}\ (i)\ \sqrt{\frac{1}{4}} + (0.01)^{-\frac{1}{2}} - (27)^{\frac{2}{3}} = \frac{3}{2}$

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88. Prove that: $\left(\frac{64}{125}\right)^{-\frac{2}{3}}+\frac{1}{\left(\frac{256}{625}\right)^{\frac{1}{4}}}+\left(\frac{\sqrt{25}}{\sqrt[3]{64}}\right)=\frac{65}{16}$

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89. Prove that: $\frac{3^{-3}\times 6^{2}\times\sqrt{98}}{5^{2}\times\sqrt[3]{\frac{1}{25}}\times(15)^{-\frac{4}{3}}\times 3^{\frac{1}{3}}}=28\sqrt{2}$

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90. Prove that: $\frac{(0.6)^{0}-(0.1)^{-1}}{\left(\frac{3}{8}\right)^{-1}\left(\frac{3}{2}\right)^{3}+\left(-\frac{1}{3}\right)^{-1}}=-\frac{3}{2}$

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91. $\frac{1}{1+x^{a-b}}+\frac{1}{1+x^{b-a}}=?$

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92. Show that: $(i)\ \left(x^{a-b}\right)^{a+b}\left(x^{b-c}\right)^{b+c}\left(x^{c-a}\right)^{c+a}=1$

$(ii)\ \left\{\left(x^{a}-a^{(-1)}\right)^{\frac{1}{a-1}}\right\}^{\frac{a}{a+1}}=x$

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93. Show that: $\left(a^{x-y}\right)^{x+y}.\left(a^{y-z}\right)^{y+z}.\left(x^{z-x}\right)^{z+x}=1$

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94. Show that: $\left(\frac{3^{a}}{3^{b}}\right)^{a+b}\left(\frac{3^{b}}{3^{c}}\right)^{b+c}\left(\frac{3^{c}}{3^{a}}\right)^{c+a}=1$

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95. If $2^x = 3^y = 12^z$ show that $\frac{1}{z} = \frac{1}{y} + \frac{2}{x}$

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96. If $2^x = 3^y = 6^{-z}$ prove that $\frac{1}{x} + \frac{1}{y} + \frac{1}{z} = 0$

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97. If $a^x = b^y = c^z$ and $b^2 = ac$, then show that $y = \frac{2zx}{z+x}$

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98. If $3^x = 5^y = (75)^z$ show that $z = \frac{xy}{2x+y}$

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99. If $27^x = \frac{9}{3^x}$, find x.

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100. Find the value of x in each of the following:

$(i)\left(\frac{3}{5}\right)^x\left(\frac{5}{3}\right)^{2x} = \frac{125}{27}$ $(ii)\ 5^{x-2} \times 3^{2x-3} = 135$

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101. Find the value of x in each of the following:

(i)$2^{x-7} \times 5^{x-4} = 1250$

(ii) $(4)^{2x+\frac{1}{2}} = \frac{1}{32}$

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102. Find the value of x in each of the following: $(i)\ 5^{2x+3} = 1$

$(ii)\ (13)^{\sqrt{x}} = 4^4 - 3^4 - 6\ (iii)\ \left(\sqrt{\frac{3}{5}}\right)^{x+1} = \frac{125}{27}$

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103. If $x = 2^{\frac{1}{3}} + 2^{\frac{2}{3}}$ show that $x^3 - 6x = 6$

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104. Determine $(8x)^x$, if $9^{x+2} = 240 + 9^x$

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105. If $3^{x+1} = 9^{x-2}$, find the value of 2^{1+x}

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106. If $3^{4x} = (81)^{-1}$ and $10^{\frac{1}{y}} = 0.0001$, find the value of 2^{-x+4y}

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107. If $5^{3x} = 125$ and $10^{y} = 0.001$ find x and y C

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108. If a and b are different positive primes such that

$(i)\left(\frac{a^{-1}b^{2}}{a^{2}b^{-4}}\right)^{7} \div \left(\frac{a^{3}b^{-5}}{a^{-2}b^{3}}\right) = a^{x}b^{y}$, find x and y

$(ii)\ (a+b)^{-1}\left(a^{-1}+b^{-1}\right) = a^{x}b^{y}$, find $x+y+2$

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109. If $1176 = 2^a \times 3^b \times 7^c$, find the values of a, b and c.

Hence, compute the value of $2^a \times 3^b \times 7^{-c}$ as a fraction.

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110. Simplify:

(i) $\left(\frac{x^{a+b}}{x^c}\right)^{a-b} \left(\frac{x^{b+c}}{x^a}\right)^{b-c} \left(\frac{x^{c+a}}{x^b}\right)^{c-a}$

(ii) $\left(\frac{x^l}{x^m}\right)^{\frac{1}{lm}} \times \left(\frac{x^m}{x^n}\right)^{\frac{1}{mn}} \times \left(\frac{x^n}{x^l}\right)^{\frac{1}{ln}}$

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111. Show that: $\frac{\left(a+\frac{1}{b}\right)^m \times \left(a-\frac{1}{b}\right)^n}{\left(b+\frac{1}{a}\right)^m \times \left(b-\frac{1}{a}\right)^n} = \left(\frac{a}{b}\right)^{m+n}$

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112. If $a = x^{m+n}\, y^1,\ b - x^{n+l}\, y^m$ and $c = x^{l+m} y^n,$ prove that $a^{m-n}\, b^{n-1}\, c^{1-m} = 1$

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113. If $x = a^{m+n},\ y = a^{n+l}$ and $z = a^{l+m}$, prove that $x^m y^n z^l = x^n y^l z^m$

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114. Write $(625)^{-\frac{1}{4}}$ in decimal form

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115. State the product law of exponents.

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116. State the power law of exponents

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117. For any positive real number x, find the value of $\left(\frac{x^a}{x^b}\right)^{a+b} \times \left(\frac{x^b}{x^c}\right)^{b+c} \times \left(\frac{x^c}{x^a}\right)^{c+a}$

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118. Write the value of $\left\{5(8^{-\frac{1}{2}})^{-\frac{1}{4}}\right\}^2$

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119. For any positive real number x;write the value of $\left\{(x^a)^b\right\}^{\frac{1}{ab}}\left\{(x^b)^c\right\}^{\frac{1}{bc}}\left\{(x^c)^a\right\}^{\frac{1}{ca}}$

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120. If $(x-1)^3=8$, what is the value of $(x+1)^2$?

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121. If $2^4 \times 4^2 = 16^x$, then find the value of x ?

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122. If $3^{x-1}=9$ and $4^{y+2}=64$, what is the value of $\frac{x}{y}$?

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123. Write the value of $\sqrt[3]{7} \times \sqrt[3]{49}$

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124. Write $\left(\frac{1}{9}\right)^{-\frac{1}{2}} \times (64)^{-\frac{1}{3}}$ as a rational number.

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125. Write the value of $\sqrt[3]{125} \times \sqrt[3]{27}$

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126. The value of $\left\{2-3(2-3)^3\right\}^3$ is 5 (b) 125 (c) $\frac{1}{5}$ (d) -125

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127. $(256)^{0.16} \times (256)^{0.09} = ?$ 4 b. 16 c. 64 d. 256. 25

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128. If $10^{2y} = 25$, then 10^{-y} equals $-\frac{1}{5}$ (b) $\frac{1}{50}$ (c) $\frac{1}{625}$ (d) $\frac{1}{5}$

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129. The value of $x - y^{x-y}$ when $x = 2$ and $y = -2$ is 18 (b) -18 (c) 14 (d) -14

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130. The product of the square root of x with the cube root of x is (a) cube root of the square root of x (b) sixth root of the fifth power of x (c) fifth root of the sixth power of x (d) sixth root of x

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131. if $9^{x+2} = 240 + 9^x$, then $x =$ 0. 5 (b) 0.2 (c) 0.4 (d) 0.1

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132. The seventh root of x divided by the eight root of x is x (b) $\sqrt{x}$ (d) x^{56} (d) $\frac{1}{x^{56}}$

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133. The square root of 64 divided by the cube root of 64 is 64

(b) 2 (c) $\frac{1}{2}$ (d) $64^{\frac{2}{3}}$

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134. Which of the following is (are) not equal to $\left\{\left(\frac{5}{6}\right)^{\frac{1}{5}}\right\}^{-\frac{1}{6}}$?

$(a)\ \left(\frac{5}{6}\right)^{\frac{1}{5}-\frac{1}{6}}$ $(b)\ \frac{1}{\left\{(5)^{\frac{1}{5}}\right\}^{\frac{1}{6}}}$ $(c)\ \left(\frac{6}{5}\right)^{\frac{1}{30}}$ $(d)\ \left(\frac{5}{6}\right)^{-\frac{1}{30}}$

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135. When simplified $\left(x^{-1}+y^{-1}\right)^{-1}$ is equal to $(a)\ xy$ (b) $x+y$ (c) $\frac{xy}{x+y}$ (d) $\frac{x+y}{xy}$

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136. If $8^{x+1} = 64$, what is the value of 3^{2x+1} ? 1 (b) 3 (c) 9 (d) 27

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137. If x is a positive real number and $x^2 = 2$, then $x^3 = \sqrt{2}$ (b) $2\sqrt{2}$ (c) $3\sqrt{2}$ (d) 4

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138. If $\left(2^3\right)^2 = 4^x$, then $3^x =$ 3 (b) 6 (c) 9 (d) 27

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139. If $10^x = 64$, what is the value of $10^{\frac{x}{2}+1}$? (a) 18 (b) 42 (c) 80 (d) 81

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140. If $\frac{x}{x^{1.5}} = 8x^{-1}$ and $x > 0$, then $x =$ $\frac{\sqrt{2}}{4}$ (b) $2\sqrt{2}$ (c) 4 (d) 64

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141. If $g = t^{\frac{2}{3}} + 4t^{-\frac{1}{2}}$, what is the value of g when $t = 64$?

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142. If $x^{-2} = 64$, then $x^{\frac{1}{3}} + x^0 =$ (a) 2 (b) 3 (c) $\frac{3}{2}$ (d) $\frac{2}{3}$

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143. If $4^x - 4^{x-1} = 24$, then $(2x)^x$ equals $5\sqrt{5}$ (b) $\sqrt{5}$ (c) $25\sqrt{5}$ (d) 125

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144. When simplified $\left(-\frac{1}{27}\right)^{-\frac{2}{3}}$ is 9 (b) -9 (c) $\frac{1}{9}$ (d) $-\frac{1}{9}$

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145. Which one of the following is not equal to $\left(\frac{100}{9}\right)^{-\frac{3}{2}}$?

$(a)\ \left(\frac{9}{100}\right)^{\frac{3}{2}}$ (b) $\frac{1}{\left(\frac{100}{9}\right)^{\frac{3}{2}}}$ $(c)\ \frac{3}{10} \times \frac{3}{10} \times \frac{3}{10}$ (d) $\sqrt{\frac{100}{9} x \frac{100}{9} x \frac{100}{9}}$

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146. When simplified $(256)^{-\left(4^{(-3/2)}\right)}$ is 8 (b) $\frac{1}{8}$ (c) 2 (d) $\frac{1}{2}$

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147. If a, b, c are positive real numbers, then $\sqrt{a^{-1}b} \times \sqrt{b^{-1}c} \times \sqrt{c^{-1}a}$ is equal to: (a) 1 (b) abc (c) $\sqrt{abc}$ (d) $\frac{1}{abc}$

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148. If $\frac{3^{2x-8}}{225} = \frac{5^3}{5^x}$, then $x =$ 2 (b) 3 (c) 5 (d) 4

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149. If $\left(\frac{2}{3}\right)^x \left(\frac{3}{2}\right)^{2x} = \frac{81}{16}$, . then $x =$ 2 (b) 3 (c) 4 (d) 1

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150. If $a,\ b,\ c$ are positive real numbers, then $\sqrt[5]{3125\, a^{10}b^5c^{10}}$ is equal to $(a)\ 5a^2bc^2$ (b) $25ab^2c\ 5a^3bc^3$ (d) $125\, a^2bc^2$

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151. The value of $64^{-\frac{1}{3}}\left(64^{\frac{1}{3}}-64^{\frac{2}{3}}\right),$ is 1 (b) $\frac{1}{3}$ (c) -3 (d) -2

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152. If $\sqrt{5^n}=125,$ then $5^{n\sqrt{64}}=$ 25 (b) $\frac{1}{125}$ (c) 625 (d) $\frac{1}{5}$

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153. If $(16)^{2x+3} = (64)^{x+3}$, then $4^{2x-2} = 64(b)256(c)32(d)512$

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154. If $a,\ m,\ n$ are positive integers, then $\left\{\sqrt[m]{\sqrt{a}}\right\}^{mn}$ is equal to a^{mn} (b) a (c) $a^{\frac{m}{n}}$ (d) 1

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155. If $2^{-m} \times \frac{1}{2^m} = \frac{1}{4}$, then $\frac{1}{14}\left\{(4^m)^{1/2} + \left(\frac{1}{5^m}\right)^{-1}\right\}$ is equal to $\frac{1}{2}$ (b) 2 (c) 4 (d) $-\frac{1}{4}$

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156. If $x = 2$ and $y = 4$, then $\left(\frac{x}{y}\right)^{x-y} + \left(\frac{y}{x}\right)^{y-x} =$

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157. The value of m for which $\left[\left\{\left(\frac{1}{7^2}\right)^{-2}\right\}^{-\frac{1}{3}}\right]^{\frac{1}{4}} = 7^m,$

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158. If $\frac{2^{m+n}}{2^{m-n}} = 16$ and $a = 2^{\frac{1}{10}}$ then $\frac{\left(a^{2m+n-p}\right)^2}{\left(a^{m-2n+2p} - 1\right)^{-1}} =$

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159. The value of $\left\{\left(23+2^2\right)^{\frac{2}{3}}+(140-19)^{\frac{1}{2}}\right\}^2$, is 196 (b) 289 (c) 324 (d) 400

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160. $If\ \sqrt{2^n}=1024,$ then $3^{2\left(\frac{n}{4}-4\right)}=$ 3 (b) 9 (c) 27 (d) 81

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161. If $\frac{3^{5x}\times 81^2\times 6561}{3^{2x}}=3^7,$ then $x=$ (a) 3 (b) -3 (c) $\frac{1}{3}$ (d) $-\frac{1}{3}$

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162. State the quotient law of exponents

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163. The value of $\{8^{-\frac{4}{3}} \div 2^{-2})^{\frac{1}{2}}$ is (a) $\frac{1}{2}$ (b) 2 (c) $\frac{1}{4}$ (d) 4

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