

Práctica 1 - Operaciones Fundamentales

1. Simplificar

$$E = \left\{ m^{-1} \left[m \left(m^3 \right)^{\frac{1}{2}} \right]^{\frac{1}{5}} \right\}^{-2}$$

2. Calcular

$$R = \sqrt[n]{\frac{3^{n+1}}{n+2} \sqrt[9]{9\sqrt{9^n}}}$$

3. Calcular:

$$M = \sqrt[n]{\frac{6^n + 10^n + 15^n}{5^{-n} + 2^{-n} + 3^{-n}}}$$

4. Resolver

$$n^{-1} \sqrt[3]{2^{3n-1}} - {}^{3n-7}\sqrt{8^{n-3}} = 0$$

5. Resolver

$$\left(\frac{4}{3}\right)^{x-1} \sqrt{\frac{3}{4}} = \frac{16}{9}$$

6. Determinar el valor de:

$$E = \sqrt[n]{\frac{256^{n+1} \cdot {}^{n+1}\sqrt{4^{n^2-1}}}{64^{n+1} \cdot {}^{n-1}\sqrt{4^{-1}}}}$$

7. Determinar el valor de:

$$A = \frac{5^{\frac{2a}{a-b}} + 15 \cdot 5^{\frac{2b}{a-b}}}{a^{-b} \sqrt{5^{a+b}}}$$

8. Calcular $A^2 - 1$, si:

$$A = {}^{81}3^n \sqrt{\left[\sqrt[3]{216^{3^{3n+1}}} \right]^{3^{3n}}}$$

9. Simplificar

$$\sqrt[n]{\frac{x^{3n} + \sqrt[n]{\frac{x^{4n^2} + x^{3n^2}}{x^{2n^2} + x^{n^2}}}}{x^n + 1}}$$

10. Simplificar

$$M = \sqrt[n]{x^n \cdot \sqrt[n]{x^{n^2}} \cdot \sqrt[n]{x^{n^3}} \cdot \sqrt[n]{x^{n^4}} \dots \sqrt[n]{x^{n^n}}}$$

11. Calcular

$$L = \sqrt[n]{\frac{5^{2n} \cdot 2^{n+1} + 50^n}{5^n \cdot 8^{-5^{n+1}}} \cdot \frac{{}^{n+1}\sqrt{5^{n^2-1}}}{\sqrt{5^{-2}} \cdot {}^{1/n}\sqrt{5^{-1}}}}$$

12. Determinar n en la igualdad:

$$\underbrace{\sqrt{x^3} \sqrt{x^3} \sqrt{x^3} \dots \sqrt{x^3}}_{\text{"n" radicales}} = x^{\left(\frac{32}{95}\right)^{-1}}$$

13. Efectuar

$$\frac{15^6 \cdot 12^4 \cdot 5^9 \cdot 6^3}{10^{11} \cdot 3^{13} \cdot 5^4}$$

14. Simplificar

$$N = \frac{2^{n+4} - 2^{n+3}}{2^{n+4}}$$

15. Calcular:

$$A = 32^{25} \cdot 8^{-3} \cdot 1^8$$

16. Hallar el valor de :

$$M = \left[\frac{5^{n^2+3} - 5^{n^2+2} + 5^{n^2+1}}{5^{n^2+2} - 5^{n^2}} \right]^{-1}$$

17. Reducir:

$$R = \left(\sqrt[2]{\sqrt{4 \cdot 2\sqrt{2}}} \right)^{(\sqrt{2}-1)}$$

18. Calcular:

$$P = (2)^{1/7} \cdot (9)^{2/7} \cdot \left(2 + \frac{1}{4}\right)^{3/7} \cdot \left(4 + \frac{1}{2}\right)^{2/7}$$

19. Reducir:

$$A = \sqrt{\frac{5 \cdot 4^{n-1}}{2^{2n-2} + 4^{n-2}}}$$

20. Hallar el valor reducido de:

$$F = (0, 1)^{-1} \cdot (0, 3) \cdot (0, 5)^{-2} \cdot (0, 25)^{1/2}$$

21. Calcular:

$$X = \left(\left(\dots \left(5^{10} \right)^9 \dots \right)^{-9} \right)^{-10}$$

22. Reducir:

$$M = \frac{(0, 5)^{n-1} \cdot 2^{n+1}}{(0, 25)^{n+2} \cdot 4^{n-2}}$$

23. Efectuar:

$$E = \frac{3^{3/m} \sqrt{(32)^{-9} \sqrt[4]{3} \sqrt[2]{4^2}}}{(0, 125)^{5m}}$$

24. Calcular:

$$P = \sqrt[n]{\frac{36(38^n)}{27^{2n+1} + 9^{3n+1}}} + \sqrt[4n]{\frac{1 + 81^n}{1 + 81^{-n}}}$$

25. Simplificar:

$$R = \left[\frac{(ab^{-1})^b}{(a^{-1}b)^a} \right]^{\frac{a}{ab+b^2}} \cdot \left(\frac{b}{a} \right)^{\frac{a}{b}}$$

26. Calcular $\left(\frac{2}{3}\right)^{a+b}$ sabiendo que:

a) $2^{a+b} = 6^b$

b) $3^a = 3(2^{b+1})$

27. Reducir:

$$A = (3^{27})^{3^7} : 3+2^{-2}(-2)^2-2^{-2}(-2)^{-2}$$

28. Simplificar:

$$B = a^{-b} \sqrt[2]{\frac{xy}{b\sqrt{(xy)^a}}} \cdot b^{-1} \sqrt[3]{\frac{xy^b}{b\sqrt{xy}}}$$

29. Reduciendo:

$$\frac{\sqrt{x^3 \cdot \sqrt{x^3}}}{\sqrt[3]{x^2 \cdot \sqrt[3]{x^2}}}$$

obtenemos una expresión de la forma $a^2 \sqrt{x^{b^2}}$, indicar $a + b$, si a, b son números naturales.

30. Reducir: Si $a^a = a + 1$; reducir:

$$Q = a^{a^a} \sqrt{(a+1)^{a+1}}$$

31. Calcular el valor de:

$$E = \log_5 125 + \log_{\sqrt{x}} x + 3^{\log_3 5} - 10^{\log 4}$$

32. Calcular:

$$P = 4^{\log_2 2} + 27^{\log_3 2}$$

33. Calcular x en :

$$x = \log_2 \log_3 3^{\log_{2.5} 6.25}$$

34. Calcular:

$$S = 9^{\log_2 5 \cdot \log_3 2} + 4^{\log_{11} 3 \cdot \log_2 11}$$

35. Calcular:

$$E = \log_{\sqrt{8}} (\log_{\sqrt{2}} 2)$$

36. Calcular:

$$S = \log_{16} \log_8 2\sqrt{2}$$

37. Hallar el valor de x en:

$$x = \log_b \{ \text{Antilog}_{b^2} [\log_b 3 (\text{Antilog}_{b^4} 3)] \}$$

38. Reducir:

$$A = \log \frac{32}{243} + \log \frac{75}{16} + \frac{1}{3} \log 8 - 2 \log \frac{5}{9}$$

39. Calcular:

$$A = \log_2 5^{\log_5 2^{\log_2 7^{\log_7 5^{\log_5 8}}}}$$

40. Calcular el valor de:

$$E = \frac{\sqrt{\sqrt{30 + \sqrt{30 + \dots (\infty \text{ radicales})}}}}{\sqrt{6 + \sqrt{6 + \dots (\infty \text{ radicales})}}}$$

41. Si

$$A = \sqrt{20 + \sqrt{20 + \sqrt{20 + \sqrt{20 + \dots}}}}$$

Además

$$Q = \sqrt[4]{A + 11 + \sqrt[4]{A + 11 + \dots}}$$

Determinar: $\sqrt[4]{Q^4 - Q}$

42. Calcular el valor de x:

$$x^{\log \sqrt{x}} = 100$$

43. Resolver:

$$\log_2 \log_3 (x + 2) = 2$$

44. Resolver:

$$\sqrt{\log x} = \log \sqrt{x}$$

45. Hallar x, si:

$$2 \log_9 (x + 4) = 1 + \log_3 x$$

46. Resolver:

$$x^{\log_2 x} = 16$$

47. Calcular:

$$\log(x + 1) + \log(2x - 1) = \log x$$

48. Si $\log_{\sqrt[3]{x}} 16 = 4$, evaluar $\log_2 2x$.

49. Resolver:

$$(\log_x 3)(\log_{x/3} 3) + \log_{x/81} 3 = 0$$

50. Hallar x en:

$$\log_{(x+1)} 5x + \log 5 + \log x = \log 50x$$