

Exponents & Power

1) Evaluate each of the following

a) $(2/11)^4 (11/3)^2 (3/2)^3$ b) $(2/3)^2 \cdot (2/5)^{-3} \cdot (3/5)^2$
(Ans (a) 6/12 (b) 5/2)

2) If $a=2, b=4$ then find the value of

i) $a^a + b^b$ ii) $a^b + b^a$
(Ans (i) 31 (ii) 17)

3) Find value of x if

a) $2^{x-3}=1$ b) $3^{3x-3}=1/9^x$
(Ans (a) $x=3$ (b) $x=1$)

4) Solve the following equations

i) $2^{5x} / 2^x = 2^4$ ii) $7^x \times 3^x \times 2^x = 1764$
(Ans (i) 1 ii) 2)

5) Evaluate

i) $(13^2 - 5^2)^{3/2}$ ii) $(1^3 + 2^3 + 3^3 + 4^3)^{-3/2}$
(Ans (i) 1728 (ii) 1/1000)

6) Express in Exponential form:

i) $\sqrt[13]{111^3}$ ii) $\sqrt[5]{34}$ iii) $\sqrt[6]{\left(\frac{25}{321}\right)^{-5}}$
(Ans i) $(111)^{3/13}$ ii) $(34)^{1/5}$ iii) $(25/321)^{-5/6}$

7) Evaluate

i) $(256/6561)^{-5/8}$ ii) $(\sqrt{x}^3 \sqrt[3]{x^5}) / \sqrt[5]{x^3} * (\sqrt[30]{x^{77}})$ iii) $(x^{1/2})^4$
(Ans i) 243/32 ii) $x^{77/15}$ iii) x^2

8) By what number should we multiply $81^{3/16}$ so that the product becomes $3^{5/4}$
(Ans $3^{1/2}$)

9) Find the value of

i) $81^{1/3} * 576^{1/3}$

ii) $64^{-2/3} * 27^{-2/3}$

(Ans i) 36 ii) 1/144)

10) Simplify $[5(8^{1/3} + 27^{1/3})^3]^{1/4}$

(Ans 5)

11) Evaluate $2x27^{1/3}x216^{-2/3}$

(Ans 1/6)

12) Using laws of exponents, simplify

i) $(2^{-3}/5)^{-2}$ ii) $(3^{-2} x 2^{-2})^{-3}$

(Ans i) 32 ii) 6^6)

13) Evaluate

i) $(11/12)^3$ ii) $(3/4)^{-3}$

(Ans i) 1331/1728 ii) 64/27)

14) Find the value $(125)^{2/3} / (25)^{1/2}$

(Ans 5)

15) Evaluate $(9^3 x 27 x 81^4) / (3^{-2} x 3^4 x 81^2)$

(Ans 3^{15})

16) Evaluate $2^{55} x 2^{60} - 2^{97} x 2^{18}$

(Ans 0)

17) If $a = -3$ $b = 2$ than find the value of $(1/a - 1/b)^2$

(Ans 25/36)

18) Simplify i) $27^{7/5} / 27^{2/5}$

(Ans 27)

19) Find value of $2x^2 + y^3$ for $x = -1/3$, $y = -2/3$

(Ans -2/27)

20) Solve $a^6 - (b+1)^3$ when $a = 1/2$ $b = -3/4$

(Ans 0)

21) Simplify

$[(1/2)^2 - (1/4)^3] * 2^3$

(Ans 15/8)

22) Find value of

$$(-1/5)^3 \times (-1)^{85} \times (2/5)^2$$

(Ans 4/3125)

23) Simplify & express with positive exponents

$$[(9/11)^{-3} \times (9/11)^{-7}] / (9/11)^{-3}$$

(Ans $(11/9)^7$)

24) Find value of m if $(2/9)^3 \times (2/9)^{-6} = (2/9)^{2m-1}$

(Ans m = -1)

25) Express in power notation $(-2/7)^{-3} \times (-2/7)^{-3} \times (-2/7)^{-3}$

(Ans $(-7/2)^9$)