

EJERCICIOS DE POTENCIAS

1 Simplifica empleando las leyes de los exponentes

1 $3^3 \cdot 3^4 \cdot 3$

2 $5^7 : 5^3$

3 $(5^3)^4$

4 $(5 \cdot 2 \cdot 3)^4$

5 $(3^4)^4$

6 $\left[(5^3)^4\right]^2$

7 $(8^2)^3$

8 $(9^3)^2$

9 $2^5 \cdot 2^4 \cdot 2$

10 $2^7 : 2^6$

11 $(2^2)^4$

12 $(4 \cdot 2 \cdot 3)^4$

13 $(2^5)^4$

14 $\left[(2^3)^4\right]^0$

15 $(27^2)^5$

16 $(4^3)^2$

2 Realizar las siguientes operaciones con potencias:

1 $(-2)^2 \cdot (-2)^3 \cdot (-2)^4$

2 $(-8) \cdot (-2)^2 \cdot (-2)^0 \cdot (-2)$

3 $(-2)^{-2} \cdot (-2)^3 \cdot (-2)^4$

4 $2^{-2} \cdot 2^{-3} \cdot 2^4$

5 $2^2 : 2^3$

6 $2^{-2} : 2^3$

7 $2^2 : 2^{-3}$

8 $2^{-2} : 2^{-3}$

9 $[(-2)^{-2}]^3 \cdot (-2)^3 \cdot (-2)^4$

10 $[(-2)^6 : (-2)^3]^3 \cdot (-2) \cdot (-2)^{-4}$

SOLUCIONES

Ejercicio 1.

$$1 \quad 3^3 \cdot 3^4 \cdot 3 = 3^{(3+4+1)} = 3^8$$

$$2 \quad 5^7 : 5^3 = 5^{(7-3)} = 5^4$$

$$3 \quad (5^3)^4 = 5^{(3 \cdot 4)} = 5^{12}$$

$$4 \quad (5 \cdot 2 \cdot 3)^4 = 5^4 \cdot 2^4 \cdot 3^4$$

$$5 \quad (3^4)^4 = 3^{(4 \cdot 4)} = 3^{16}$$

$$6 \quad [(5^3)^4]^2 = 5^{(3 \cdot 4 \cdot 2)} = 5^{24}$$

$$7 \quad (8^2)^3 = [(2^3)^2]^3 = 2^{(3 \cdot 2 \cdot 3)} = 2^{18}$$

$$8 \quad (9^3)^2 = [(3^2)^3]^2 = 3^{(2 \cdot 3 \cdot 2)} = 3^{12}$$

$$9 \quad 2^5 \cdot 2^4 \cdot 2 = 2^{(5+4+1)} = 2^{10}$$

$$10 \quad 2^7 : 2^6 = 2^{(7-6)} = 2^1 = 2$$

$$11 \quad (2^2)^4 = 2^{(2 \cdot 4)} = 2^8$$

$$12 \quad (4 \cdot 2 \cdot 3)^4 = (2^2 \cdot 2 \cdot 3)^4 = (2^3 \cdot 3)^4 = (2^3)^4 \cdot 3^4 = 2^{12} \cdot 3^4$$

$$13 \quad (2^5)^4 = 2^{(5 \cdot 4)} = 2^{20}$$

$$14 \quad [(2^3)^4]^0 = 2^{(3 \cdot 4 \cdot 0)} = 2^0 = 1$$

$$15 \quad (27^2)^5 = [(3^3)^2]^5 = 3^{(3 \cdot 2 \cdot 5)} = 3^{30}$$

$$16 \quad (4^3)^2 = \left[(2^2)^3\right]^2 = 2^{(2 \cdot 3 \cdot 2)} = 2^{12}$$

Ejercicio 2

$$1 \quad (-2)^2 \cdot (-2)^3 \cdot (-2)^4 = (-2)^{(2+3+4)} = (-2)^9 = -512$$

$$2 \quad (-8) \cdot (-2)^2 \cdot (-2)^0 \cdot (-2) = (-2)^3 \cdot (-2)^2 \cdot (-2)^0 \cdot (-2) = (-2)^6 = 64$$

$$3 \quad (-2)^{-2} \cdot (-2)^3 \cdot (-2)^4 = (-2)^{(-2+3+4)} = (-2)^5 = -32$$

$$4 \quad 2^{-2} \cdot 2^{-3} \cdot 2^4 = 2^{(-2+(-3)+4)} = 2^{-1}$$

$$5 \quad 2^2 : 2^3 = 2^{(2-3)} = 2^{-1}$$

$$2^{-1} = \frac{1}{2}$$

$$6 \quad 2^{-2} : 2^3 = 2^{(-2-3)} = 2^{-5}$$

$$2^{-5} = \left(\frac{1}{2}\right)^5 = \frac{1^5}{2^5} = \frac{1}{32}$$

$$7 \quad 2^2 : 2^{-3} = 2^{(2-(-3))} = 2^5 = 32$$

$$8 \quad 2^{-2} : 2^{-3} = 2^{(-2-(-3))} = 2^1 = 2$$

$$9 \quad [(-2)^{-2}]^3 \cdot (-2)^3 \cdot (-2)^4 = (-2)^{-6} \cdot (-2)^3 \cdot (-2)^4$$

$$(-2)^{-6} \cdot (-2)^3 \cdot (-2)^4 = (-2)^{(-6+3+4)} = (-2)^1 = -2$$

$$10 \quad [(-2)^6 : (-2)^3]^3 \cdot (-2) \cdot (-2)^{-4} = [(-2)^3]^3 \cdot (-2) \cdot (-2)^{-4}$$

$$[(-2)^3]^3 \cdot (-2) \cdot (-2)^{-4} = (-2)^9 \cdot (-2) \cdot (-2)^{-4} = (-2)^6 = 64$$