BOLETÍN 01 - POTENCIAS DE BASE FRACCIONARIA 01

Matemáticas · 3.º ESO

Simplifica las siguientes expresiones aplicando las propiedades de las potencias. Expresa el resultado como una sola potencia con exponente positivo siempre que sea posible.

1) $2^5 \cdot 2^3$

2) $(-3)^7 : (-3)^4$

3) $\left(5^2\right)^3$

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

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

6) $\left(\frac{2}{3}\right)^4 \cdot \left(\frac{2}{3}\right)^3$

7) $\left(\frac{5}{2}\right)^6 : \left(\frac{5}{2}\right)^4$

8) $\left[\left(\frac{3}{4}\right)^2\right]^3$

9) $\left(-\frac{2}{5}\right)^3 \cdot \left(-\frac{2}{5}\right)^4 : \left(-\frac{2}{5}\right)^2$

10) $\left(\frac{7}{3}\right)^{-2}$

11) $\left(-\frac{3}{5}\right)^4 : \left(-\frac{3}{5}\right)^{-2}$

12) $\left[\left(\frac{2}{7}\right)^{-2}\right]^3$

13) $\left(\frac{4}{9}\right)^3 \cdot \left(\frac{9}{4}\right)^{-2}$

14) $\left(-\frac{5}{3}\right)^4 \cdot \left(-\frac{3}{5}\right)^{-3}$

15) $\left(\frac{2}{5}\right)^3 : \left(\frac{5}{2}\right)^{-4}$

16) $\left[\left(-\frac{3}{7}\right)^2\right]^3 : \left(-\frac{3}{7}\right)^4$

17) $\left(\frac{3}{2}\right)^4 \cdot \left(\frac{2}{3}\right)^{-2} : \left(\frac{3}{2}\right)^3$

18) $\left[\left(\frac{5}{6}\right)^{-2}\right]^2 \cdot \left(\frac{6}{5}\right)^{-3}$

19) $\left[\left(\frac{2}{3}\right)^3\right]^2 : \left(\frac{2}{3}\right)^4 \cdot \left(\frac{3}{2}\right)^{-3}$

20) $\dfrac{\left(-\frac{4}{5}\right)^{-2} \cdot \left(-\frac{5}{4}\right)^3}{\left(-\frac{4}{5}\right)^{-1}}$

Soluciones

1)

$$2^5 \cdot 2^3 = 2^{5+3} = \boxed{2^8}$$

2)

$$(-3)^7 : (-3)^4 = (-3)^{7-4} = \boxed{(-3)^3}$$

3)

$$\left(5^2\right)^3 = 5^{2\cdot 3} = \boxed{5^6}$$

4)

$$(-2)^4 \cdot (-2)^3 : (-2)^2 = (-2)^{4+3-2} = \boxed{(-2)^5}$$

5)

$$\left[(-4)^3\right]^2 : (-4)^4 = (-4)^{3\cdot 2} : (-4)^4 = (-4)^{6-4} = \boxed{(-4)^2}$$

6)

$$\left(\frac{2}{3}\right)^4 \cdot \left(\frac{2}{3}\right)^3 = \left(\frac{2}{3}\right)^{4+3} = \boxed{\left(\frac{2}{3}\right)^7}$$

7)

$$\left(\frac{5}{2}\right)^6 : \left(\frac{5}{2}\right)^4 = \left(\frac{5}{2}\right)^{6-4} = \boxed{\left(\frac{5}{2}\right)^2}$$

8)

$$\left[\left(\frac{3}{4}\right)^2\right]^3 = \left(\frac{3}{4}\right)^{2\cdot 3} = \boxed{\left(\frac{3}{4}\right)^6}$$

9)

$$\left(-\frac{2}{5}\right)^3 \cdot \left(-\frac{2}{5}\right)^4 : \left(-\frac{2}{5}\right)^2 = \left(-\frac{2}{5}\right)^{3+4-2} = \boxed{\left(-\frac{2}{5}\right)^5}$$

10)

$$\left(\frac{7}{3}\right)^{-2} = \boxed{\left(\frac{3}{7}\right)^{2}}$$

11)

$$\left(-\frac{3}{5}\right)^{4} : \left(-\frac{3}{5}\right)^{-2} = \left(-\frac{3}{5}\right)^{4-(-2)} = \boxed{\left(-\frac{3}{5}\right)^{6}}$$

12)

$$\left[\left(\frac{2}{7}\right)^{-2}\right]^{3} = \left(\frac{2}{7}\right)^{-6} = \boxed{\left(\frac{7}{2}\right)^{6}}$$

13)

$$\left(\frac{4}{9}\right)^{3} \cdot \left(\frac{9}{4}\right)^{-2} = \left(\frac{4}{9}\right)^{3} \cdot \left(\frac{4}{9}\right)^{2} = \boxed{\left(\frac{4}{9}\right)^{5}}$$

14)

$$\left(-\frac{5}{3}\right)^{4} \cdot \left(-\frac{3}{5}\right)^{-3} = \left(-\frac{5}{3}\right)^{4} \cdot \left(-\frac{5}{3}\right)^{3} = \boxed{\left(-\frac{5}{3}\right)^{7}}$$

15)

$$\left(\frac{2}{5}\right)^{3} : \left(\frac{5}{2}\right)^{-4} = \left(\frac{2}{5}\right)^{3} : \left(\frac{2}{5}\right)^{4} = \left(\frac{2}{5}\right)^{-1} = \boxed{\left(\frac{5}{2}\right)^{1}}$$

16)

$$\left[\left(-\frac{3}{7}\right)^{2}\right]^{3} : \left(-\frac{3}{7}\right)^{4} = \left(-\frac{3}{7}\right)^{6} : \left(-\frac{3}{7}\right)^{4} = \boxed{\left(-\frac{3}{7}\right)^{2}}$$

17)

$$\left(\frac{3}{2}\right)^{4} \cdot \left(\frac{2}{3}\right)^{-2} : \left(\frac{3}{2}\right)^{3} = \left(\frac{3}{2}\right)^{4} \cdot \left(\frac{3}{2}\right)^{2} : \left(\frac{3}{2}\right)^{3} = \left(\frac{3}{2}\right)^{4+2-3} = \boxed{\left(\frac{3}{2}\right)^{3}}$$

18)

$$\left[\left(\frac{5}{6}\right)^{-2}\right]^{2} \cdot \left(\frac{6}{5}\right)^{-3} = \left(\frac{5}{6}\right)^{-4} \cdot \left(\frac{5}{6}\right)^{3} = \left(\frac{5}{6}\right)^{-1} = \boxed{\left(\frac{6}{5}\right)^{1}}$$

19)

$$\left[\left(\frac{2}{3}\right)^{3}\right]^{2} : \left(\frac{2}{3}\right)^{4} \cdot \left(\frac{3}{2}\right)^{-3} = \left(\frac{2}{3}\right)^{6} : \left(\frac{2}{3}\right)^{4} \cdot \left(\frac{2}{3}\right)^{3} = \left(\frac{2}{3}\right)^{6-4+3} = \boxed{\left(\frac{2}{3}\right)^{5}}$$

20)

$$\frac{\left(-\frac{4}{5}\right)^{-2} \cdot \left(-\frac{5}{4}\right)^{3}}{\left(-\frac{4}{5}\right)^{-1}} = \frac{\left(-\frac{5}{4}\right)^{2} \cdot \left(-\frac{5}{4}\right)^{3}}{\left(-\frac{5}{4}\right)^{1}} = \left(-\frac{5}{4}\right)^{2+3-1} = \boxed{\left(-\frac{5}{4}\right)^{4}}$$