

Ejercicios de potencias

1. Escribe en forma de una sola potencia:

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. $[(5^3)^4]^2 =$
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. $[(2^3)^4]^0 =$
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. $(-8) \cdot (-2)^2 \cdot (-2)^0 (-2) =$
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. $[(-2)^6 : (-2)^3]^3 \cdot (-2) \cdot (-2)^{-4} =$

3. Realizar las siguientes operaciones con potencias:

1. $(-3)^1 \cdot (-3)^3 \cdot (-3)^4 =$
2. $(-27) \cdot (-3) \cdot (-3)^2 \cdot (-3)^0 =$
3. $(-3)^2 \cdot (-3)^3 \cdot (-3)^{-4} =$
4. $3^{-2} \cdot 3^{-4} \cdot 3^4 = 3^{-2} =$
5. $5^2 : 5^3 = 5^{-1} =$
6. $5^{-2} : 5^3 = 5^{-5} =$
7. $5^2 : 5^{-3} = 5^5 =$
8. $5^{-2} : 5^{-3} =$
9. $(-3)^1 \cdot [(-3)^3]^2 \cdot (-3)^{-4} =$
10. $[(-3)^6 : (-3)^3]^3 \cdot (-3)^0 \cdot (-3)^{-4} =$

4. Realiza las siguientes operaciones con potencias:

1. $\left(\frac{2}{3}\right)^2 \cdot \left(\frac{2}{3}\right)^3 =$
2. $\left(\frac{2}{3}\right)^{-2} \cdot \left(\frac{2}{3}\right)^3 =$
3. $\left(\frac{2}{3}\right)^2 \cdot \left(\frac{2}{3}\right)^{-3} =$
4. $\left(\frac{2}{3}\right)^{-2} \cdot \left(\frac{2}{3}\right)^{-3} =$
5. $\left(\frac{2}{3}\right)^{-2} \cdot \left(\frac{3}{2}\right)^{-3} =$
6. $\left(\frac{2}{3}\right)^2 : \left(\frac{2}{3}\right)^3 =$
7. $\left(\frac{2}{3}\right)^{-2} : \left(\frac{2}{3}\right)^3 =$
8. $\left(\frac{2}{3}\right)^2 : \left(\frac{2}{3}\right)^{-3} =$
9. $\left(\frac{2}{3}\right)^{-2} : \left(\frac{2}{3}\right)^{-3} =$
10. $\left(\frac{3}{2}\right)^{-2} : \left(\frac{2}{3}\right)^{-3} =$

11. $\left[\left(\frac{2}{3}\right)^2\right]^3 =$

12. $\left\{\left[\left(\frac{2}{3}\right)^2\right]^3\right\}^{-4} =$

13. $\left(\frac{4}{9}\right)^{-2} : \left(\frac{27}{8}\right)^{-3} =$

14. $\frac{\left(\frac{2}{3}\right)^5 \left(\frac{2}{3}\right)^0 \left(\frac{2}{3}\right)^{-3} \left(\frac{81}{16}\right)^{-2}}{\left(\frac{3}{2}\right)^{-5} \left(\frac{2}{3}\right) \left[\left(\frac{2}{3}\right)^5\right]^2 \left(\frac{8}{27}\right)^3} =$

15. $\frac{\left(2 - \frac{1}{5}\right)^2}{\left(3 - \frac{2}{9}\right)^{-1}} : \frac{\left(\frac{6}{7} \cdot \frac{5}{4} - \frac{2}{7} : \frac{1}{2}\right)^3}{\left(\frac{1}{2} - \frac{1}{3} \cdot \frac{1}{4} : \frac{1}{5}\right)} - 5\frac{1}{7} =$

Soluciones

1. Escribe en forma de una sola potencia:

1. $3^3 \cdot 3^4 \cdot 3 = 3^8$

2. $5^7 : 5^3 = 5^4$

3. $(5^3)^4 = 5^{12}$

4. $(5 \cdot 2 \cdot 3)^4 = 30^4$

5. $(3^4)^4 = 3^{16}$

6. $[(5^3)^4]^2 = (5^{12})^2 = 5^{24}$

7. $(8^2)^3 = [(2^3)^2]^3 = (2^6)^3 = 2^{18}$

8. $(9^3)^2 = [(3^2)^3]^2 = (3^6)^2 = 3^{12}$

9. $2^5 \cdot 2^4 \cdot 2 = 2^{10}$

10. $2^7 : 2^6 = 2$

11. $(2^2)^4 = 2^8$

12. $(4 \cdot 2 \cdot 3)^4 = 24^4$

13. $(2^5)^4 = 2^{20}$

14. $[(2^3)^4]^0 = (2^{12})^0 = 2^0 = 1$

15. $(27^2)^5 = [(3^3)^2]^5 = (3^6)^5 = 3^{30}$

16. $(4^3)^2 = [(2^2)^3]^2 = (2^6)^2 = 2^{12}$

2. Realizar las siguientes operaciones con potencias:

1. $(-2)^2 \cdot (-2)^3 \cdot (-2)^4 = (-2)^9 = -512$

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

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

4. $2^{-2} \cdot 2^{-3} \cdot 2^4 = 2^{-1} = 1/2$

5. $2^2 : 2^3 = 2^{-1} = 1/2$

6. $2^{-2} : 2^3 = 2^{-5} = (1/2)^5 = 1/32$

7. $2^2 : 2^{-3} = 2^5 = 32$

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

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

10. $[(-2)^6 : (-2)^3]^3 \cdot (-2) \cdot (-2)^{-4} = [(-2)^3]^3 \cdot (-2) \cdot (-2)^{-4} = (-2)^9 \cdot (-2) \cdot (-2)^{-4} = (-2)^6 = 64$

3. Realizar las siguientes operaciones con potencias:

1. $(-3)^1 \cdot (-3)^3 \cdot (-3)^4 = (-3)^8 = 6561$

2. $(-27) \cdot (-3) \cdot (-3)^2 \cdot (-3)^0 = (-3)^3 \cdot (-3) \cdot (-3)^2 \cdot (-3)^0 = (-3)^6 = 729$

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

4. $3^{-2} \cdot 3^{-4} \cdot 3^4 = 3^{-2} = (1/3)^2 = 1/9$

5. $5^2 : 5^3 = 5^{-1} = 1/5$

6. $5^{-2} : 5^3 = 5^{-5} = (1/5)^5 = 1/3125$

7. $5^2 : 5^{-3} = 5^5 = 3125$

8. $5^{-2} : 5^{-3} = 5$

9. $(-3)^1 \cdot [(-3)^3]^2 \cdot (-3)^{-4} = (-3)^1 \cdot (-3)^6 \cdot (-3)^{-4} = (-3)^3 = -27$

10. $[(-3)^6 : (-3)^3]^3 \cdot (-3)^0 \cdot (-3)^{-4} = [(-3)^3]^3 \cdot (-3)^0 \cdot (-3)^{-4} = (-3)^9 \cdot (-3)^0 \cdot (-3)^{-4} = (-3)^5 = 243$

4. Realiza las siguientes operaciones con potencias:

1. $\left(\frac{2}{3}\right)^2 \cdot \left(\frac{2}{3}\right)^3 = \left(\frac{2}{3}\right)^2 \cdot \left(\frac{2}{3}\right)^3 = \left(\frac{2}{3}\right)^5$

2. $\left(\frac{2}{3}\right)^{-2} \cdot \left(\frac{2}{3}\right)^3 = \left(\frac{2}{3}\right)^{-2} \cdot \left(\frac{2}{3}\right)^3 = \frac{2}{3}$

3. $\left(\frac{2}{3}\right)^2 \cdot \left(\frac{2}{3}\right)^{-3} = \left(\frac{2}{3}\right)^2 \cdot \left(\frac{2}{3}\right)^{-3} = \left(\frac{2}{3}\right)^{-1} = \frac{3}{2}$

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

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

$$6. \left(\frac{2}{3}\right)^2 : \left(\frac{2}{3}\right)^3 = \left(\frac{2}{3}\right)^2 : \left(\frac{2}{3}\right)^3 = \left(\frac{2}{3}\right)^{-1} = \frac{3}{2}$$

$$7. \left(\frac{2}{3}\right)^{-2} : \left(\frac{2}{3}\right)^3 = \left(\frac{2}{3}\right)^{-2} : \left(\frac{2}{3}\right)^3 = \left(\frac{2}{3}\right)^{-5} = \left(\frac{3}{2}\right)^5$$

$$8. \left(\frac{2}{3}\right)^2 : \left(\frac{2}{3}\right)^{-3} = \left(\frac{2}{3}\right)^2 : \left(\frac{2}{3}\right)^{-3} = \left(\frac{2}{3}\right)^5$$

$$9. \left(\frac{2}{3}\right)^{-2} : \left(\frac{2}{3}\right)^{-3} = \left(\frac{2}{3}\right)^{-2} : \left(\frac{2}{3}\right)^{-3} = \frac{2}{3}$$

$$10. \left(\frac{3}{2}\right)^{-2} : \left(\frac{2}{3}\right)^{-3} = \left(\frac{3}{2}\right)^{-2} : \left(\frac{2}{3}\right)^{-3} = \left(\frac{2}{3}\right)^2 : \left(\frac{2}{3}\right)^{-3} = \left(\frac{2}{3}\right)^5$$

$$11. \left[\left(\frac{2}{3}\right)^2\right]^3 = \left[\left(\frac{2}{3}\right)^2\right]^3 = \left(\frac{2}{3}\right)^6$$

$$12. \left\{\left[\left(\frac{2}{3}\right)^2\right]^3\right\}^{-4} = \left\{\left[\left(\frac{2}{3}\right)^2\right]^3\right\}^{-4} = \left(\frac{2}{3}\right)^{-24} = \left(\frac{3}{2}\right)^{24}$$

$$13. \left(\frac{4}{9}\right)^{-2} : \left(\frac{27}{8}\right)^{-3} = \left(\frac{4}{9}\right)^{-2} : \left(\frac{27}{8}\right)^{-3} = \left[\left(\frac{2}{3}\right)^2\right]^{-2} : \left[\left(\frac{3}{2}\right)^3\right]^{-3} = \left(\frac{2}{3}\right)^{-4} : \left(\frac{3}{2}\right)^{-9} =$$

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

$$14. \frac{\left(\frac{2}{3}\right)^5 \left(\frac{2}{3}\right)^0 \left(\frac{2}{3}\right)^{-3} \left(\frac{81}{16}\right)^{-2}}{\left(\frac{3}{2}\right)^{-5} \left(\frac{2}{3}\right) \left[\left(\frac{2}{3}\right)^5\right]^2 \left(\frac{8}{27}\right)^3} =$$

$$= \frac{\left(\frac{2}{3}\right)^5 \left(\frac{2}{3}\right)^0 \left(\frac{2}{3}\right)^{-3} \left[\left(\frac{3}{2}\right)^4\right]^{-2}}{\left(\frac{3}{2}\right)^{-5} \left(\frac{2}{3}\right) \left[\left(\frac{2}{3}\right)^5\right]^2 \left[\left(\frac{2}{3}\right)^3\right]^3} = \frac{\left(\frac{2}{3}\right)^5 \left(\frac{2}{3}\right)^0 \left(\frac{2}{3}\right)^{-3} \left(\frac{3}{2}\right)^{-8}}{\left(\frac{3}{2}\right)^{-5} \left(\frac{2}{3}\right) \left(\frac{2}{3}\right)^{10} \left(\frac{2}{3}\right)^9} =$$

$$= \frac{\left(\frac{2}{3}\right)^5 \left(\frac{2}{3}\right)^0 \left(\frac{2}{3}\right)^{-3} \left(\frac{2}{3}\right)^8}{\left(\frac{2}{3}\right)^5 \left(\frac{2}{3}\right) \left(\frac{2}{3}\right)^{10} \left(\frac{2}{3}\right)^9} = \frac{\left(\frac{2}{3}\right)^{10}}{\left(\frac{2}{3}\right)^{25}} = \left(\frac{2}{3}\right)^{-15} = \left(\frac{3}{2}\right)^{15}$$

$$15. \frac{\left(2 - \frac{1}{5}\right)^2}{\left(3 - \frac{2}{9}\right)^{-1}} ; \frac{\left(\frac{6}{7} \cdot \frac{5}{4} - \frac{2}{7} ; \frac{1}{2}\right)^3}{\left(\frac{1}{2} - \frac{1}{3} \cdot \frac{1}{4} ; \frac{1}{5}\right)} - 5 \frac{1}{7} =$$

$$= \frac{\left(\frac{10-1}{5}\right)^2}{\left(\frac{27-2}{9}\right)^{-1}} ; \frac{\left(\frac{30}{28} - \frac{4}{7}\right)^3}{\left(\frac{1}{2} - \frac{1}{12} ; \frac{1}{5}\right)} - \frac{35+1}{7} = \frac{\left(\frac{9}{5}\right)^2}{\left(\frac{25}{9}\right)^{-1}} ; \frac{\left(\frac{15-4}{14} - \frac{4}{7}\right)^3}{\left(\frac{1}{2} - \frac{5}{12}\right)} - \frac{36}{7} =$$

$$= \frac{\left(\frac{9}{5}\right)^2}{\left(\frac{25}{9}\right)^{-1}} ; \frac{\left(\frac{15-8}{14}\right)^3}{\left(\frac{6-5}{12}\right)} - \frac{36}{7} = \frac{\left(\frac{9}{5}\right)^2}{\left(\frac{25}{9}\right)^{-1}} ; \frac{\left(\frac{1}{2}\right)^3}{\frac{1}{12}} - \frac{36}{7} =$$

$$= \frac{81}{25} ; \frac{1}{\frac{1}{12}} - \frac{36}{7} = \frac{81}{25} ; \frac{12}{1} - \frac{36}{7} =$$

$$= 9 ; \frac{3}{2} - \frac{36}{7} = \frac{18}{3} - \frac{36}{7} = 6 - \frac{36}{7} = \frac{42-36}{7} = \frac{6}{7}$$