

Product of powers

Write each product as a single power.

1. $3^5 \times 3^{-3} = 3^2$

2. $4^3 \times 4^3 = 4^6$

3. $7^{-4} \times 7^2 = 7^{-2}$

4. $5^7 \times 5^3 = 5^{10}$

5. $4^7 \times 4^{-1} = 4^6$

6. $6^{-4} \times 6^{-4} = 6^{-8}$

7. $2^6 \times 2^4 = 2^{10}$

8. $2^2 \times 2^6 = 2^8$

9. $3^2 \times 3^7 = 3^9$

10. $2^4 \times 2^{-1} = 2^3$

11. $10^3 \times 10^3 = 10^6$

12. $6^{-1} \times 6^6 = 6^5$

Quotient of powers

Write each quotient as a single power.

1. $3^9 \div 3^4 = 3^5$

2. $4^{-3} \div 4^3 = 4^{-6}$

3. $10^5 \div 10^7 = 10^{-2}$

4. $2^{-1} \div 2^7 = 2^{-8}$

5. $7^8 \div 7^2 = 7^6$

6. $7^8 \div 7^5 = 7^3$

7. $5^5 \div 5^7 = 5^{-2}$

8. $3^6 \div 3^4 = 3^2$

9. $10^5 \div 10^3 = 10^2$

10. $6^{-3} \div 6^4 = 6^{-7}$

11. $3^8 \div 3^3 = 3^5$

12. $5^7 \div 5^{-1} = 5^8$

Power of a power

Write each expression as a single power.

1. $(4^5)^4 = 4^{20}$

2. $(7^2)^2 = 7^4$

3. $(6^{-2})^2 = 6^{-4}$

4. $(5^2)^3 = 5^6$

5. $(5^{-3})^3 = 5^{-9}$

6. $(6^3)^{-4} = 6^{-12}$

7. $(6^5)^2 = 6^{10}$

8. $(6^5)^3 = 6^{15}$

9. $(10^2)^3 = 10^6$

10. $(7^5)^4 = 7^{20}$

11. $(2^3)^4 = 2^{12}$

12. $(3^5)^{-4} = 3^{-20}$

Zero and negative exponents

Evaluate. Write fractions in simplest form.

1. $2^{-3} = \underline{\quad \mathbf{1/8} \quad}$

2. $4^{-1} = \underline{\quad \mathbf{1/4} \quad}$

3. $10^{-3} = \underline{\quad \mathbf{1/1000} \quad}$

4. $5^{-2} = \underline{\quad \mathbf{1/25} \quad}$

5. $2^{-2} = \underline{\quad \mathbf{1/4} \quad}$

6. $5^0 = \underline{\quad \mathbf{1} \quad}$

7. $3^{-1} = \underline{\quad \mathbf{1/3} \quad}$

8. $10^{-4} = \underline{\quad \mathbf{1/10000} \quad}$

9. $3^0 = \underline{\quad \mathbf{1} \quad}$

10. $10^{-2} = \underline{\quad \mathbf{1/100} \quad}$

11. $2^0 = \underline{\quad \mathbf{1} \quad}$

12. $4^0 = \underline{\quad \mathbf{1} \quad}$

Mixed practice

Simplify to a single power, then evaluate.

1. $3^{-4} \times 3^{-2} =$ 1/729

2. $(3^3)^3 \div 3^9 =$ 1

3. $(5^2)^3 \div 5^2 =$ 625

4. $3^5 \times 3^{-4} =$ 3

5. $(10^3)^2 \div 10^9 =$ 1/1000

6. $(3^2)^3 \div 3^7 =$ 1/3

7. $10^5 \times 10^{-2} =$ 1000

8. $3^{-1} \div 3^3 =$ 1/81

9. $5^{-6} \times 5^2 =$ 1/625

10. $(2^2)^3 \div 2^4 =$ 4

11. $2^{-3} \times 2^3 =$ 1

12. $(10^2)^3 \div 10^3 =$ 1000