

Product of powers

Write each product as a single power.

1. $10^{-4} \times 10^{-3} = 10^{-7}$

2. $2^7 \times 2^6 = 2^{13}$

3. $10^5 \times 10^{-1} = 10^4$

4. $6^6 \times 6^{-2} = 6^4$

5. $5^6 \times 5^2 = 5^8$

6. $10^7 \times 10^4 = 10^{11}$

7. $4^4 \times 4^3 = 4^7$

8. $6^2 \times 6^2 = 6^4$

9. $6^{-2} \times 6^4 = 6^2$

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

11. $2^{-2} \times 2^{-2} = 2^{-4}$

12. $6^4 \times 6^6 = 6^{10}$

Quotient of powers

Write each quotient as a single power.

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

2. $10^3 \div 10^8 = 10^{-5}$

3. $6^9 \div 6^2 = 6^7$

4. $10^6 \div 10^2 = 10^4$

5. $4^4 \div 4^{-1} = 4^5$

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

7. $7^2 \div 7^6 = 7^{-4}$

8. $7^5 \div 7^8 = 7^{-3}$

9. $5^4 \div 5^7 = 5^{-3}$

10. $3^2 \div 3^8 = 3^{-6}$

11. $10^{-1} \div 10^6 = 10^{-7}$

12. $4^9 \div 4^4 = 4^5$

Power of a power

Write each expression as a single power.

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

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

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

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

5. $(10^{-2})^{-4} = 10^8$

6. $(7^{-3})^3 = 7^{-9}$

7. $(7^{-2})^{-4} = 7^8$

8. $(4^{-3})^2 = 4^{-6}$

9. $(7^{-3})^2 = 7^{-6}$

10. $(3^{-3})^{-4} = 3^{12}$

11. $(2^{-3})^2 = 2^{-6}$

12. $(2^2)^{-3} = 2^{-6}$

Zero and negative exponents

Evaluate. Write fractions in simplest form.

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

2. $10^0 = \underline{1}$

3. $5^0 = \underline{1}$

4. $2^0 = \underline{1}$

5. $4^0 = \underline{1}$

6. $4^{-2} = \underline{1/16}$

7. $4^{-3} = \underline{1/64}$

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

9. $2^{-2} = \underline{1/4}$

10. $5^{-1} = \underline{1/5}$

11. $5^{-3} = \underline{1/125}$

12. $10^{-2} = \underline{1/100}$

Mixed practice

Simplify to a single power, then evaluate.

1. $(3^3)^2 \div 3^4 =$ 9

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

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

4. $(3^3)^2 \div 3^6 =$ 1

5. $(2^2)^3 \div 2^6 =$ 1

6. $10^{-1} \div 10^{-2} =$ 10

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

8. $(3^3)^3 \div 3^6 =$ 27

9. $10^3 \div 10^5 =$ 1/100

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

11. $(2^3)^3 \div 2^2 =$ 128

12. $(2^3)^3 \div 2^7 =$ 4