

Product of powers

Write each product as a single power.

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

2. $3^3 \times 3^6 = 3^9$

3. $6^{-3} \times 6^5 = 6^2$

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

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

6. $6^4 \times 6^3 = 6^7$

7. $5^6 \times 5^{-2} = 5^4$

8. $3^6 \times 3^{-2} = 3^4$

9. $10^4 \times 10^2 = 10^6$

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

11. $10^{-3} \times 10^{-2} = 10^{-5}$

12. $10^5 \times 10^7 = 10^{12}$

Quotient of powers

Write each quotient as a single power.

1. $5^8 \div 5^3 = 5^5$

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

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

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

5. $5^7 \div 5^3 = 5^4$

6. $10^3 \div 10^5 = 10^{-2}$

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

8. $4^5 \div 4^6 = 4^{-1}$

9. $5^2 \div 5^7 = 5^{-5}$

10. $2^7 \div 2^8 = 2^{-1}$

11. $3^8 \div 3^2 = 3^6$

12. $6^{-2} \div 6^8 = 6^{-10}$

Power of a power

Write each expression as a single power.

1. $(7^{-2})^{-4} = \underline{7^8}$

2. $(10^4)^2 = \underline{10^8}$

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

4. $(5^3)^{-2} = \underline{5^{-6}}$

5. $(6^{-3})^3 = \underline{6^{-9}}$

6. $(4^5)^3 = \underline{4^{15}}$

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

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

9. $(4^{-3})^2 = \underline{4^{-6}}$

10. $(4^2)^3 = \underline{4^6}$

11. $(10^3)^3 = \underline{10^9}$

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

Zero and negative exponents

Evaluate. Write fractions in simplest form.

1. $10^0 =$ 1

2. $10^{-4} =$ 1/10000

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

4. $3^{-2} =$ 1/9

5. $5^{-2} =$ 1/25

6. $10^{-2} =$ 1/100

7. $2^{-3} =$ 1/8

8. $3^0 =$ 1

9. $4^{-2} =$ 1/16

10. $5^0 =$ 1

11. $2^{-2} =$ 1/4

12. $2^0 =$ 1

Mixed practice

Simplify to a single power, then evaluate.

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

2. $(3^3)^2 \div 3^3 =$ 27

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

4. $3^{-6} \times 3^2 =$ 1/81

5. $3^2 \div 3^{-2} =$ 81

6. $5^2 \div 5^3 =$ 1/5

7. $5^6 \div 5^3 =$ 125

8. $(2^3)^2 \div 2^2 =$ 16

9. $10^3 \times 10^{-2} =$ 10

10. $(2^2)^3 \div 2^2 =$ 16

11. $2^{-2} \div 2^{-1} =$ 1/2

12. $5^4 \times 5^{-6} =$ 1/25