

Laws of exponents — Multiplying powers

Name: _____

Date: _____

Write each product as one power. Give the exponent n .

1 $6^6 \times 6^{10} = 6^n$, $n = \underline{16}$

2 $10^5 \times 10^6 = 10^n$, $n = \underline{\hspace{2cm}}$

3 $10^1 \times 10^5 = 10^n$, $n = \underline{\hspace{2cm}}$

4 $4^{10} \times 4^5 = 4^n$, $n = \underline{\hspace{2cm}}$

5 $3^9 \times 3^4 = 3^n$, $n = \underline{\hspace{2cm}}$

6 $2^{13} \times 2^5 = 2^n$, $n = \underline{\hspace{2cm}}$

7 $10^{13} \times 10^1 = 10^n$, $n = \underline{\hspace{2cm}}$

8 $2^8 \times 2^4 = 2^n$, $n = \underline{\hspace{2cm}}$

9 $12^{10} \times 12^4 = 12^n$, $n = \underline{\hspace{2cm}}$

10 $5^4 \times 5^1 = 5^n$, $n = \underline{\hspace{2cm}}$

11 $12^4 \times 12^2 = 12^n$, $n = \underline{\hspace{2cm}}$

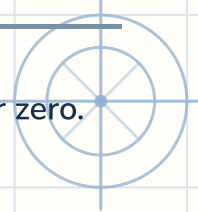
12 $10^{12} \times 10^6 = 10^n$, $n = \underline{\hspace{2cm}}$



Laws of exponents — Dividing powers

Name: _____

Date: _____



Write each quotient as one power. Give the exponent n — it may be negative or zero.

1 $4^{12} \div 4^8 = 4^n$, $n =$ 4

2 $7^{13} \div 7^1 = 7^n$, $n =$ _____

3 $5^2 \div 5^{15} = 5^n$, $n =$ _____

4 $2^5 \div 2^5 = 2^n$, $n =$ _____

5 $12^{10} \div 12^3 = 12^n$, $n =$ _____

6 $2^5 \div 2^{13} = 2^n$, $n =$ _____

7 $10^{12} \div 10^{14} = 10^n$, $n =$ _____

8 $2^2 \div 2^6 = 2^n$, $n =$ _____

9 $9^{12} \div 9^{12} = 9^n$, $n =$ _____

10 $8^{14} \div 8^{14} = 8^n$, $n =$ _____

11 $11^1 \div 11^1 = 11^n$, $n =$ _____

12 $12^{13} \div 12^8 = 12^n$, $n =$ _____

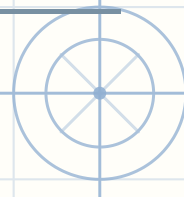


Laws of exponents — A power of a power

Name: _____

Date: _____

Write each power of a power as one power. Give the exponent n .



1 $(2^5)^4 = 2^n$, $n = \underline{20}$

2 $(10^6)^7 = 10^n$, $n = \underline{\hspace{2cm}}$

3 $(3^3)^7 = 3^n$, $n = \underline{\hspace{2cm}}$

4 $(8^7)^2 = 8^n$, $n = \underline{\hspace{2cm}}$

5 $(5^4)^5 = 5^n$, $n = \underline{\hspace{2cm}}$

6 $(11^3)^8 = 11^n$, $n = \underline{\hspace{2cm}}$

7 $(3^3)^2 = 3^n$, $n = \underline{\hspace{2cm}}$

8 $(8^5)^8 = 8^n$, $n = \underline{\hspace{2cm}}$

9 $(5^5)^5 = 5^n$, $n = \underline{\hspace{2cm}}$

10 $(11^1)^5 = 11^n$, $n = \underline{\hspace{2cm}}$

11 $(6^7)^6 = 6^n$, $n = \underline{\hspace{2cm}}$

12 $(7^1)^4 = 7^n$, $n = \underline{\hspace{2cm}}$



Roots — Square roots

Name: _____

Date: _____

Find each square root.

1 $\sqrt{841} = \underline{29}$

2 $\sqrt{196} = \underline{\hspace{2cm}}$

3 $\sqrt{16} = \underline{\hspace{2cm}}$

4 $\sqrt{169} = \underline{\hspace{2cm}}$

5 $\sqrt{100} = \underline{\hspace{2cm}}$

6 $\sqrt{400} = \underline{\hspace{2cm}}$

7 $\sqrt{484} = \underline{\hspace{2cm}}$

8 $\sqrt{4} = \underline{\hspace{2cm}}$

9 $\sqrt{36} = \underline{\hspace{2cm}}$

10 $\sqrt{9} = \underline{\hspace{2cm}}$

11 $\sqrt{144} = \underline{\hspace{2cm}}$

12 $\sqrt{729} = \underline{\hspace{2cm}}$



Roots — Cube roots

Name: _____

Date: _____

Find each cube root.

$$1 \quad \sqrt[3]{1000} = \underline{10}$$

$$2 \quad \sqrt[3]{343} = \underline{\quad}$$

$$3 \quad \sqrt[3]{1331} = \underline{\quad}$$

$$4 \quad \sqrt[3]{1728} = \underline{\quad}$$

$$5 \quad \sqrt[3]{27} = \underline{\quad}$$

$$6 \quad \sqrt[3]{8} = \underline{\quad}$$

$$7 \quad \sqrt[3]{729} = \underline{\quad}$$

$$8 \quad \sqrt[3]{216} = \underline{\quad}$$

$$9 \quad \sqrt[3]{64} = \underline{\quad}$$

$$10 \quad \sqrt[3]{512} = \underline{\quad}$$

$$11 \quad \sqrt[3]{125} = \underline{\quad}$$



Scientific notation — Scientific to standard form

Name: _____

Date: _____

Write each number in standard form.

1 $4 \times 10^4 = \underline{40000}$

2 $9.2 \times 10^6 = \underline{\hspace{2cm}}$

3 $3.8 \times 10^4 = \underline{\hspace{2cm}}$

4 $1.3 \times 10^8 = \underline{\hspace{2cm}}$

5 $2.4 \times 10^4 = \underline{\hspace{2cm}}$

6 $8.9 \times 10^4 = \underline{\hspace{2cm}}$

7 $4 \times 10^3 = \underline{\hspace{2cm}}$

8 $4.6 \times 10^8 = \underline{\hspace{2cm}}$

9 $7.9 \times 10^4 = \underline{\hspace{2cm}}$

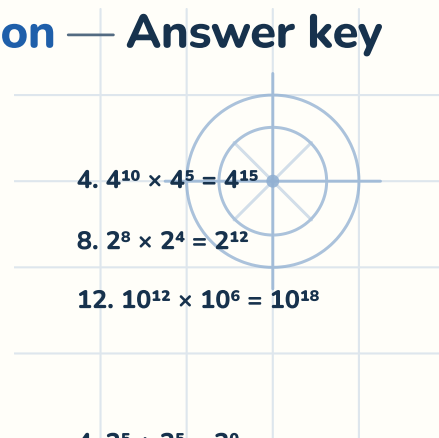
10 $8 \times 10^6 = \underline{\hspace{2cm}}$

11 $1.3 \times 10^6 = \underline{\hspace{2cm}}$

12 $4.1 \times 10^6 = \underline{\hspace{2cm}}$



Power Pack · Powers, roots and scientific notation — Answer key



Product rule

1. $6^6 \times 6^{10} = 6^{16}$

2. $10^5 \times 10^6 = 10^{11}$

3. $10^1 \times 10^5 = 10^6$

5. $3^9 \times 3^4 = 3^{13}$

6. $2^{13} \times 2^5 = 2^{18}$

7. $10^{13} \times 10^1 = 10^{14}$

9. $12^{10} \times 12^4 = 12^{14}$

10. $5^4 \times 5^1 = 5^5$

11. $12^4 \times 12^2 = 12^6$

4. $4^{10} \times 4^5 = 4^{15}$

8. $2^8 \times 2^4 = 2^{12}$

12. $10^{12} \times 10^6 = 10^{18}$

Quotient rule

1. $4^{12} \div 4^8 = 4^4$

2. $7^{13} \div 7^1 = 7^{12}$

3. $5^2 \div 5^{15} = 5^{-13}$

4. $2^5 \div 2^5 = 2^0$

5. $12^{10} \div 12^3 = 12^7$

6. $2^5 \div 2^{13} = 2^{-8}$

7. $10^{12} \div 10^{14} = 10^{-2}$

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

9. $9^{12} \div 9^{12} = 9^0$

10. $8^{14} \div 8^{14} = 8^0$

11. $11^1 \div 11^1 = 11^0$

12. $12^{13} \div 12^8 = 12^5$

Power of a power

1. $(2^5)^4 = 2^{20}$

2. $(10^6)^7 = 10^{42}$

3. $(3^3)^7 = 3^{21}$

4. $(8^7)^2 = 8^{14}$

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

6. $(11^3)^8 = 11^{24}$

7. $(3^3)^2 = 3^6$

8. $(8^5)^8 = 8^{40}$

9. $(5^5)^5 = 5^{25}$

10. $(11^1)^5 = 11^5$

11. $(6^7)^6 = 6^{42}$

12. $(7^1)^4 = 7^4$

Square roots

1. $\sqrt{841} = 29$

2. $\sqrt{196} = 14$

3. $\sqrt{16} = 4$

4. $\sqrt{169} = 13$

5. $\sqrt{100} = 10$

6. $\sqrt{400} = 20$

7. $\sqrt{484} = 22$

8. $\sqrt{4} = 2$

9. $\sqrt{36} = 6$

10. $\sqrt{9} = 3$

11. $\sqrt{144} = 12$

12. $\sqrt{729} = 27$

Cube roots

1. $\sqrt[3]{1000} = 10$

2. $\sqrt[3]{343} = 7$

3. $\sqrt[3]{1331} = 11$

4. $\sqrt[3]{1728} = 12$

5. $\sqrt[3]{27} = 3$

6. $\sqrt[3]{8} = 2$

7. $\sqrt[3]{729} = 9$

8. $\sqrt[3]{216} = 6$

9. $\sqrt[3]{64} = 4$

10. $\sqrt[3]{512} = 8$

11. $\sqrt[3]{125} = 5$

Scientific

1. $4 \times 10^4 = 40000$

2. $9.2 \times 10^6 = 9200000$

3. $3.8 \times 10^4 = 38000$

4. $1.3 \times 10^8 = 130000000$

5. $2.4 \times 10^4 = 24000$

6. $8.9 \times 10^4 = 89000$

7. $4 \times 10^3 = 4000$

8. $4.6 \times 10^8 = 460000000$

9. $7.9 \times 10^4 = 79000$

10. $8 \times 10^6 = 8000000$

11. $1.3 \times 10^6 = 1300000$

12. $4.1 \times 10^6 = 4100000$