

Powers and Exponents

Let's See What You Remember...

1. $2^4 =$

- A. $2+2+2+2$
- B. 2×4
- C. 4×2
- D. $2 \times 2 \times 2 \times 2$

2. $5^3 =$

- A. 15
- B. 125
- C. 8
- D. 243

3. $6 \times 6 \times 6 \times 6 =$

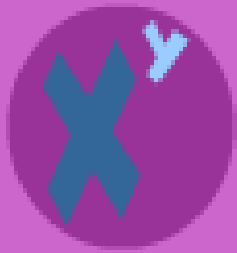
- A. 6×4
- B. 4×6
- C. 6^4
- D. $6+4$

4. 4 squared is the same as .

- A. 4×2
- B. 2^4
- C. $4+4$
- D. 4^2

5. 6 cubed is the same as .

- A. 6×3
- B. 6^3
- C. $6+6+6$
- D. 3^6



EXPONENTS

<http://www.brainpop.com/math/numbersandoperations/exponents/preview.weml>

Whenever we have variables which contain exponents and have equal bases, we can do certain mathematical operations to them. Those operations are called the “Laws of Exponents”

$$\mathbf{b^x}$$

b = base


x = exponent

Vocabulary

exponent form

base

exponent


$$5^3 =$$

$$5 \times 5 \times 5 = 125$$

factor form or

standard form

Vocabulary

$$2^3 = 2 \cdot 2 \cdot 2 = 8$$

Exponent
Form

Expanded/Factored
Form

Standard
Form

$3^2 =$

$5^2 =$

$8^1 =$

Special names for special exponents

Exponents ² and ³ can also be written or read another way:

- 3^2 is read three "squared"
- 3^3 is read three "cubed"

Words	Numbers	Algebra
Any number or variable raised to one power is ALWAYS equal to itself.	$3^1 = 3$	$b^1 = b$
Any number or variable raised to zero power is ALWAYS equal to 1.	$3^0 = 1$	$b^0 = 1$
You cannot leave a negative exponent in an expression	$3^{-2} = \frac{1}{3^2}$ or $\frac{1}{9}$	$a^{-n} = \frac{1}{a^n}$
	$\frac{1}{3^{-2}} = 3^2$ or 9	$\frac{1}{a^{-n}} = a^n$

Write the expression using exponents.

$$68 \cdot 68 \cdot 68 \cdot 68$$

$$68^{\square}$$

Write the expression using exponents. Enter a number in every blank.

$$9 \cdot 88 \cdot 88$$

$$9^{\square} \cdot 88^{\square}$$

Evaluate.

$$4^3 = \square$$

Evaluate.

$$2^2 = \square$$

Evaluate.

$$7^2 = \square$$

Solve for f .

$$7^2 = f$$

$$f = \boxed{}$$

Solve for t .

$$64 = 8^t$$

$$t = \boxed{}$$

Solve for y .

$$y = 3^3$$

$$y = \boxed{}$$

Solve for c .

$$c = 2^3$$

$$c = \boxed{}$$

Write the expression as a fraction with a positive exponent. Do not evaluate the expression.

$$2^{-5} = \frac{\boxed{}}{\boxed{}} \quad \text{[Calculator Icon]}$$

Write the expression as a whole number with a negative exponent. Do not evaluate the expression.

$$\frac{1}{6^4} = \boxed{}$$

Which is equivalent to $\frac{1}{6^5}$?

$\frac{1}{-6^5}$

$\frac{1}{-6^{-5}}$

6^{-5}

-6^5

Which is equivalent to 3^{-5} ?

$\frac{1}{3^5}$

$\frac{1}{3^{-5}}$

3^5

-3^{-5}

Which is equivalent to $\frac{1}{9^3}$?

$\frac{1}{9^{-3}}$

$\frac{1}{-9^{-3}}$

9^3

9^{-3}

Evaluate. Write your answer as a fraction or whole number without exponents.

$$2^{-4} = \boxed{}$$

Evaluate. Write your answer as a fraction or whole number without exponents.

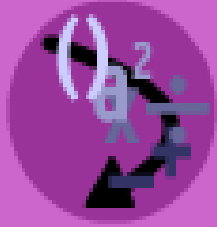
$$4^{-3} = \boxed{}$$

Evaluate. Write your answer as a fraction or whole number without exponents.

$$3^{-1} = \boxed{}$$

$$-94^0 =$$

$$200,000,000^0 =$$



ORDER OF OPERATIONS

<http://www.brainpop.com/math/numbersandoperations/orderofoperations/preview.weml>

Order of Operations

Work in order: Top down

P
Parentheses
(), { }, []

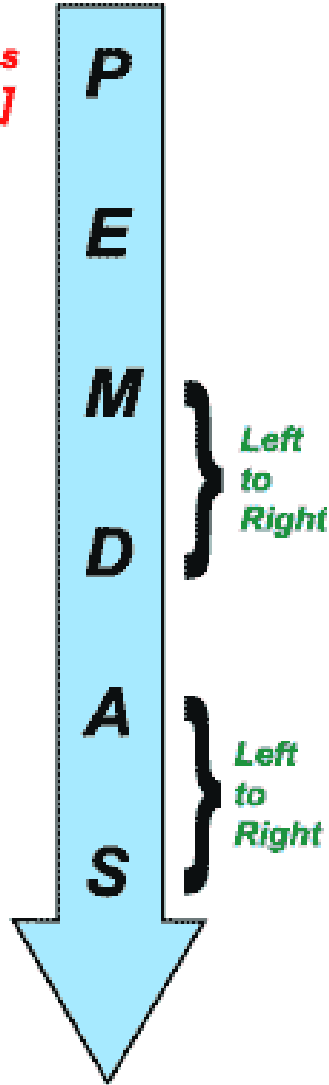
E
Exponents

M
Multiply

D
Divide

A
Add

S
Subtract



$$12 \div 2 (6 - 3) + 3^2 - 1$$

$$4^3 \div 8(4 + 2)$$

$$\frac{2(4-3)-6}{5^2+3(2+1)}$$

$$\frac{3^3-8(1+2)}{-10-(3+8)}$$

ABC Book

Page 2 (1-12), (13-27 odd),
(28, 30, 33, 34, 35)

1-12 Answer should be in
exponent form... 5^9

13-27 Answer should be
solved all the way out
into standard form....125

28-35 Answer should be
in exponent form... 5^3

Page 5 (1, 13)

1, 13 Answer should have the
negative exponent "fixed"

Page 9 (1-3, 9, 14)

Answer should have the
answer simplified all the way

ABC Book

Page 2 (1-12), (13-27 odd),
(28, 30, 33, 34, 35)

- | | | | |
|------------|---------------|----------|--------------------|
| 1. 12^5 | 9. 52^3 | | |
| 2. 111^3 | 10. $5,687^3$ | | |
| 3. 42^4 | 11. 45^2 | 19. 576 | 28. 5^2 |
| 4. 2^2 | 12. 8^8 | 21. 27 | 30. 12^2 |
| 5. 7^7 | | 23. 36 | 33. 2^3 |
| 6. 33^3 | 13. -8 | 25. -125 | 34. 9^2 or 3^4 |
| 7. 14^4 | 15. 100 | 27. 512 | 35. 3^3 |
| 8. 1^6 | 17. 1 | | |

Page 5 (1, 13)

- | | |
|--------------------|---------------------|
| 1. $\frac{1}{p^3}$ | 13. $\frac{1}{r^2}$ |
|--------------------|---------------------|

Page 9 (1-3, 9,14)

1. $\frac{1}{4}$
2. 7
3. $-\frac{3}{14}$
9. $-\frac{1}{11}$
14. $-\frac{1}{5}$

