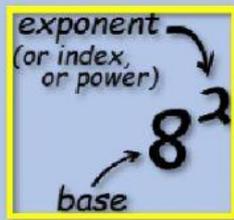# Powers and Exponents

Exponents are also called **Powers** or **Indices**

The exponent of a number says **how many times** to use the number in a **multiplication.**

In this example: $8^2 = 8 \times 8 = 64$

In words: 8^2 could be called "8 to the second power", "8 to the power 2" or simply "8 squared"

So an Exponent saves us writing out lots of multiplies!

Example: a^7

$a^7 = a \times a \times a \times a \times a \times a \times a = aaaaaaa$

Example: $10 \times 10 \times 10 = 1,000$

Each 10 is a **factor**

1,000 is the **product**.

1,000 is a **power** of 10.

You can use an exponent to tell how many times 10 is used as a factor.

$10^3 \;^{exponent} = 10 \times 10 \times 10 = 1,000$

Read 10^3 as ten to the third power.

Look for a pattern in the chart. Compare the number of zeros in the number with the exponent in the exponent form.

Number	Factor Form	Exponent Form	Read
100	10×10	10^2	ten to the second power or ten squared
1,000	$10 \times 10 \times 10$	10^3	ten to the third power or ten cubed
10,000	$10 \times 10 \times 10 \times 10$	10^4	ten to the fourth power
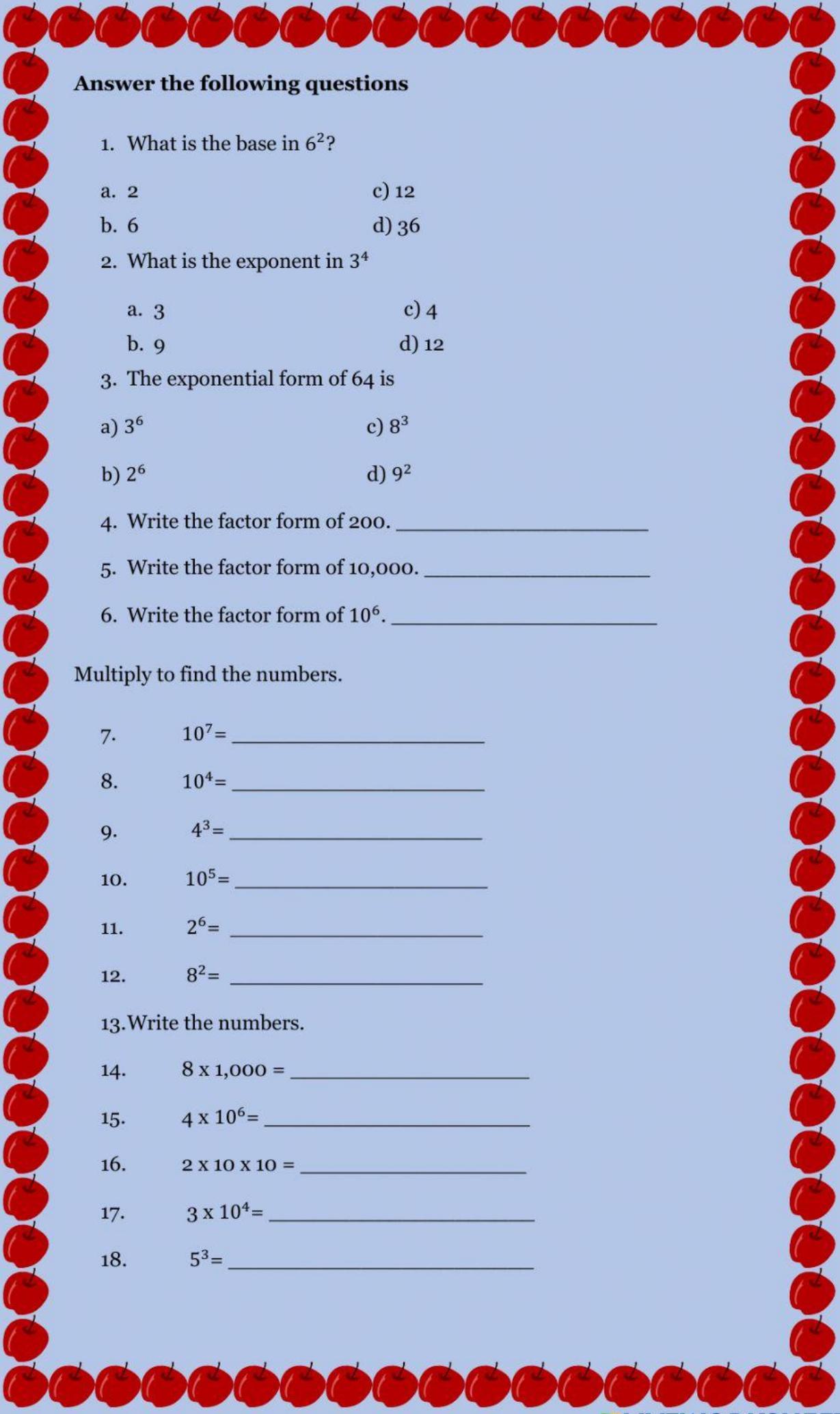
Answer the following questions

1. What is the base in 6^2?

a. 2   c) 12
b. 6   d) 36

2. What is the exponent in 3^4

a. 3   c) 4
b. 9   d) 12

3. The exponential form of 64 is

a) 3^6 c) 8^3

b) 2^6 d) 9^2

4. Write the factor form of 200. _____

5. Write the factor form of 10,000. _____

6. Write the factor form of 10^6. _____

Multiply to find the numbers.

7. $10^7 =$ _____

8. $10^4 =$ _____

9. $4^3 =$ _____

10. $10^5 =$ _____

11. $2^6 =$ _____

12. $8^2 =$ _____

13. Write the numbers.

14.   8 x 1,000 = _____

15. $4 \times 10^6 =$ _____

16.   2 x 10 x 10 = _____

17. $3 \times 10^4 =$ _____

18. $5^3 =$ _____