cuemath
THE MATH EXPERT

Get better at Math. Get better at everything.

Come experience the Cuemath methodology and ensure your child stays ahead at math this summer.

Adaptive Platform | **Interactive Visual Simulations** | **Personalized Attention**

For Grades 1 - 10

LIVE online classes by trained and certified experts.

Get the Cuemath advantage

Book a FREE trial class

cuemath
THE MATH EXPERT

8th Grade Exponents Worksheets

Questions

Q1. Simplify:

a. 3^5

b. 4^3

Q2. Simplify:

a. $(-2)^7$

b. $(-5)^2$

Q3. Simplify:

a. $\left(\frac{1}{3}\right)^5$

b. $\left(\frac{-2}{5}\right)^2$

Q4. Simplify:

a. $(-3)^0$

b. $\left(\frac{-2}{5}\right)^0$

Q5. Simplify $3^2+(-5)^3-2^2$.

Q6. Simplify $\frac{12^2-3^2}{3}$

.

Q7. Simplify

$$\left|\left(\frac{1}{2}\right)^3-\left(\frac{1}{3}\right)^2\right|.$$

Q8. Write the following as a single exponent using properties of exponents.

$$(-3)^2\times(-3)^5$$

Q9. Simplify the following and express the answer as an exponent.

$$\left(x^2\right)^3\times x^5$$

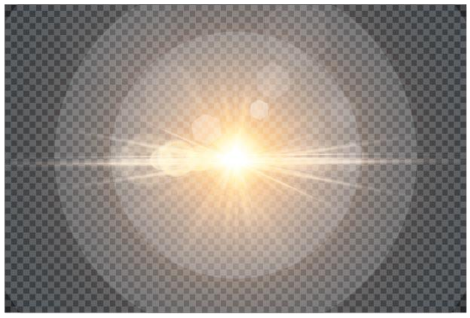
Q10. Use the properties of exponents to simplify the following.

$$\frac{(-5.2)^{12}}{(-5.2)^8\cdot(-5.2)^3}$$

Q11. Simplify the following expression using the properties of exponents.

$$\left(\frac{1}{2}x^2y^3\right)^3$$

Q12. The speed of light is $299{,}792{,}458$ meters per second. Convert this number into scientific notation.



Q13. Simplify $\frac{1.5\times10^{-6}}{2.5\times10^{8}}$ and express the answer in scientific notation.

Q14. Simplify $\left(3.8\times10^{7}\right)-\left(1.42\times10^{6}\right)$ and express the answer in scientific notation.

Q15. A laptop's storage is shown below. Also, the conversion from gigabytes to bytes is shown. Use this information to find the laptop's storage in bytes. Express your answer as an exponent.

Total storage: 32 gigabytes

1 gigabytes = 2^{30} bytes

cuemath
THE MATH EXPERT

When you learn math in an interesting way, you never forget.

25 Million
Math classes & counting

100K+
Students learning Math the right way

20+ Countries
Present across USA, UK, Singapore, India, UAE & more.

Why choose Cuemath?

"Cuemath is a valuable addition to our family. We love solving puzzle cards. My daughter is now visualizing maths and solving problems effectively!"

- Gary Schwartz

"Cuemath is great because my son has a one-on-one interaction with the teacher. The instructor has developed his confidence and I can see progress in his work. One-on-one interaction is perfect and a great bonus."

- Kirk Riley

"I appreciate the effort that miss Nitya puts in to help my daughter understand the best methods and to explain why she got a problem incorrect. She is extremely patient and generous with Miranda."

- Barbara Cabrera

Get the Cuemath advantage

Book a FREE trial class

cuemath
THE MATH EXPERT

ANSWERS

1(a) 243 (b) 64	2(a) -128 2(b) 25	3(a)1/243 3(b)4/25
4(a) 1 (b) 1	5) -120	6) 45
7) 1/72	8) -3^7	9) x^{11}
10)-5.2	11) $\frac{1}{8} \cdot x^6 \cdot y^9$	12 2.99792458×10^8
13) 6×10^{-15}	14) 3.658×10^7	15) 2^{35} bytes

SOLUTIONS

Complete solution/explanation

Solutions

Q1. Simplify:

Solution: a. $3^5 = 3 \times 3 \times 3 \times 3 \times 3 = 243$

Solution: b. $4^3 = 4 \times 4 \times 4 = 64$

Q2. Simplify:

Solution: a. $(-2)^7 = -2 \times -2 \times -2 \times -2 \times -2 \times -2 \times -2 = -128$

Solution: b. $(-5)^2 = -5 \times -5 = 25$

Q3. Simplify:

Solution: a. $\left(\frac{1}{3}\right)^5 = \frac{1}{3} \times \frac{1}{3} \times \frac{1}{3} \times \frac{1}{3} \times \frac{1}{3} = \frac{1}{243}$

Solution: b. $\left(\frac{-2}{5}\right)^2 = \frac{-2}{5} \times \frac{-2}{5} = \frac{4}{25}$

Q4. Simplify:

Solution: a. $(-3)^0 = 1$ (because every number raised to 0 is 1)

Solution: b. $\left(\frac{-2}{5}\right)^0 = 1$ (because every number raised to 0 is 1)

Q5. Simplify $3^2 + (-5)^3 - 2^2$.

Solution: We just simplify each exponent and perform operations.

$$\begin{aligned} 3^2 + (-5)^3 - 2^2 &= 9 - 125 - 4 \\ &= -120 \end{aligned}$$

Q6. Simplify $\frac{12^2 - 3^2}{3}$.

Solution: We just simplify each exponent and perform operations.

$$\begin{aligned} \frac{12^2 - 3^2}{3} &= \frac{144 - 9}{3} \\ &= \frac{135}{3} \\ &= 45 \end{aligned}$$

Q7. Simplify $\left(\frac{1}{2}\right)^3 - \left(\frac{1}{3}\right)^2$.

Solution: We just simplify each exponent and perform operations.

$$\left|\left(\frac{1}{2}\right)^3-\left(\frac{1}{3}\right)^2\right| = \left|\frac{1}{8}-\frac{1}{9}\right|$$

$$= \left|\frac{1}{72}\right|$$

$$= \frac{1}{72}$$

Q8. Write the following as a single exponent using the following using properties of exponents.

$(-3)^2 \times (-3)^5$

Solution: $(-3)^2 \times (-3)^5 = (-3)^{2+5} = (-3)^7$.

Q9. Simplify the following and express the answer as an exponent.

$\left(x^2\right)^3 \times x^5$

Solution: We will use the properties of exponents to simplify this.

$$\left(x^2\right)^3 \times x^5 = x^6 \times x^5 \left[\because \left(a^m\right)^n = a^{mn}\right]$$

$$= x^{11} \left[\because a^m \times a^n = a^{m+n}\right]$$

Q10. Use the properties of exponents to simplify the following.

$$\frac{(-5.2)^{12}}{(-5.2)^8 \cdot (-5.2)^3}$$

Solution: We will use the properties of exponents to simplify this.

$$\frac{(-5.2)^{12}}{(-5.2)^{8}\cdot(-5.2)^{3}} = \frac{(-5.2)^{12}}{(-5.2)^{11}}\left[\because \frac{a^m}{a^n} = a^{m-n}\right]$$

$$= (-5.2)^{1}\left[\because \frac{a^m}{a^n} = a^{m-n}\right]$$

$$= -5.2$$

Q11. Simplify the following expression using the properties of exponents.

$$\left(\frac{1}{2}x^2y^3\right)^3$$

Solution: We will use the properties of exponents to simplify this.

$$\left(\frac{1}{2}x^2y^3\right)^3 = \left(\frac{1}{2}\right)^3\cdot\left(x^2\right)^3\cdot\left(y^3\right)^3\left[\because (ab)^m = a^m\cdot b^m\right]$$

$$= \frac{1}{8}\cdot x^6\cdot y^9\left[\because \left(a^m\right)^n = a^{mn}\right]$$

Q12. The speed of light is $299,792,458$ meters per second. Convert this number into scientific notation.

Solution: The scientific notation of a number is of the form $a \times 10^b$, where a is a number that lies between 1 to 10 (both inclusive) and b is any integer.
We can write the speed of light as,

$$299,792,458 = 2.99792458\times10^{8}$$

This is because there are 8 digits after the first digit (2) in the given number.

Q13. Simplify $\dfrac{1.5\times10^{-6}}{2.5\times10^{8}}$ and express the answer in scientific notation.

Solution: We will apply the properties of exponents here.

$$\frac{1.5\times10^{-6}}{2.5\times10^{8}} = \frac{1.5}{2.5}\times10^{-6-8}$$
$$= 0.6\times10^{-14}$$
$$= 6\times10^{-15}$$

Q14. Simplify $\left(3.8\times10^{7}\right)-\left(1.42\times10^{6}\right)$ and express the answer in scientific notation.

Solution: For subtracting these two terms, the exponent of 10 must be the same in both numbers.

$$\left(3.8\times10^{7}\right)-\left(1.42\times10^{6}\right) = 38\times10^{6}-1.42\times10^{6}$$
$$= (38-1.42)\times10^{6}$$
$$= 36.58\times10^{6}$$
$$= 3.658\times10^{7}$$

Q15. A laptop's storage is shown below. Also, the conversion from gigabytes to bytes is shown. Use this information to find the laptop's storage in bytes. Express your answer as an exponent.

Solution: $1 \text{ gigabyte} = 2^{30} \text{ bytes}$

Total storage = $32 \text{ gigabytes} = 2^{5} \text{ gigabytes}$

Thus, total storage in bytes is,

Total storage = $2^{30}\times2^{5} \text{ bytes} = 2^{35} \text{ bytes}$

FUN FACT

1. If you raise zero to any number, it will still be zero.
2. The first time exponents was used was way back in the 15th century.
3. Robert Recorde took it further in the next century and developed the exponents system