

Important Questions for Class 7 Maths Chapter 11: These important questions from CBSE Class 7 Maths Chapter 11 Exponents and Powers are highly helpful for students as they focus on core concepts and problem-solving techniques.

By practicing these questions students can enhance their understanding of the laws of exponents, standard form, and the applications of powers in real-life situations. They also prepare students to tackle various types of problems that are frequently asked in exams, boosting their confidence and improving their overall performance in mathematics.

Important Questions for Class 7 Maths Chapter 11 Overview

Chapter 11 **Exponents and Powers** simplifies working with very large and very small numbers using exponential notation. It introduces students to the concept of exponents, where a number (base) is raised to a power (exponent), representing repeated multiplication. The chapter covers important topics like:

- **Laws of Exponents:** Understanding how to multiply and divide powers with the same base, raising a power to a power, and dealing with numbers raised to zero or negative exponents.
- **Standard Form:** Learning to express very large or very small numbers in standard form for easier computation and comparison.

The important questions often include simplifying expressions, comparing exponential forms, writing numbers in standard form, and solving application-based problems. These questions are designed to build a strong foundation in handling exponents and powers ensuring conceptual clarity and practical problem-solving abilities.

Important Questions for Class 7 Maths Chapter 11 PDF

The Important Questions for Class 7 Maths Chapter 11 Exponents and Powers PDF is an excellent resource for students to strengthen their understanding of this crucial topic.

With step-by-step solutions and examples, it serves as a handy guide for exam preparation and quick revision. Download the PDF from the link provided below to strengthen your knowledge and practice effectively.

Important Questions for Class 7 Maths Chapter 11 PDF

Important Questions for CBSE Class 7 Maths Chapter 11 Exponents and Powers

Here are some important questions from Class 7 Maths Chapter 11 Exponents and Powers along with their solutions:

Question 1. What are the base, exponent, and value of the exponential form?

Solution:

A base is a number that is to be multiplied by itself as per the exponent.

The exponent, or index, basically represents the number of times a base is to be multiplied by itself.

The product of the base with itself, according to the exponent, is the value of the exponential form.

Question 2. Identify the base, exponent, and value of the following:

- 25
- 34

Solution:

- When a number is repeatedly multiplied by itself then it can be represented in an index or exponential notation. Like in 25

$$25 = 2 \times 2 \times 2 \times 2 \times 2 = 32.$$

In this equation, 2 is the base, 5 is the exponent or index and 32 is the value which is the fifth power of 2.

1. $3^4 = 81$

Since it can be written as.

$$3 \times 3 \times 3 \times 3 = 81$$

81 is the value of 3 to the power of 4.

Question 3. Calculate the value of the following:

- 26
- 93
- 112
- 54
- 24
- 52
- $(4/7)^3$

Solution:

1. For $2^6 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 64$

In this 2 is the base, 6 is the exponent and 64 is the value.

1. For $9^3 = 9 \times 9 \times 9 = 729$

In this 9 is the base, 3 is the exponent and 729 is the value.

1. For $11^2 = 11 \times 11 = 121$

In this, 11 is the base, 2 is the exponent and 121 is the value.

1. For $5^4 = 5 \times 5 \times 5 \times 5 = 625$

In the, 5 is the base, 4 is the exponent and the value is 625.

1. For $2^4 = 2 \times 2 \times 2 \times 2 = 16$.

In this 2 is the base, 4 is the exponent and 16 is the value.

1. For $5^2 = 5 \times 5 = 25$

In this 5 is the base, 2 is the exponent and the value is 25.

1. In the given, $4/7$ is the base and the exponent is 3. So to calculate the value,

$$47 \times 47 \times 47 = 64343$$

Question 4. Find the value of:

(i) $(-1)^{1000}$

(ii) $(1)^{250}$

(iii) $(-1)^{121}$

(iv) $(10000)^0$

Solution:

(i) $(-1)^{1000} = 1$ [$\because (-1)^{\text{even number}} = 1$]

(ii) $(1)^{250} = 1$ [$\because (1)^{\text{even number}} = 1$]

(iii) $(-1)^{121} = -1$ [$\because (-1)^{\text{odd number}} = -1$]

(iv) $(10000)^0 = 1$ [$\because a^0 = 1$]

Question 5. Express the following in exponential form:

(i) $5 \times 5 \times 5 \times 5 \times 5$

(ii) $4 \times 4 \times 4 \times 5 \times 5 \times 5$

(iii) $(-1) \times (-1) \times (-1) \times (-1) \times (-1)$

(iv) $a \times a \times a \times b \times c \times c \times c \times d \times d$

Solution:

(i) $5 \times 5 \times 5 \times 5 \times 5 = (5)^5$

(ii) $4 \times 4 \times 4 \times 5 \times 5 \times 5 = 4^3 \times 5^3$

(iii) $(-1) \times (-1) \times (-1) \times (-1) \times (-1) = (-1)^5$

(iv) $a \times a \times a \times b \times c \times c \times c \times d \times d = a^3b^1c^3d^2$

Question 6. Express each of the following as product of powers of their prime factors:

(i) 405

(ii) 504

(iii) 500

Solution:

(i) We have

$$405 = 3 \times 3 \times 3 \times 3 \times 5 = 3^4 \times 5^1$$

Thus, $405 = 3^4 \times 5^1$

(ii) We have

$$504 = 2 \times 2 \times 2 \times 3 \times 3 \times 7 = 2^3 \times 3^2 \times 7^1$$

Thus, $504 = 2^3 \times 3^2 \times 7^1$

(iii) We have

$$500 = 2 \times 2 \times 5 \times 5 \times 5 = 2^2 \times 5^3$$

Thus, $500 = 2^2 \times 5^3$

Question 7. Simplify the following and write in exponential form:

(i) $(5^2)^3$

(ii) $(2^3)^3$

(iii) $(a^b)^c$

(iv) $[(5)^2]^2$

Solution:

(i) $(5^2)^3 = 5^{2 \times 3} = 5^6$

(ii) $(2^3)^3 = 2^{3 \times 3} = 2^9$

(iii) $(a^b)^c = a^{b \times c} = a^{bc}$

(iv) $[(5)^2]^2 = 5^{2 \times 2} = 5^4$

Question 8: Simplify the following:

- 2×10^3
- 72×22
- 23×5
- 3×44
- 0×10^2
- 52×33
- 24×32
- 32×10^4

Solution:

1. 2×10^3 can be written as $2 \times 10 \times 10 \times 10 = 2 \times 1000 = 2000$
2. 72×22 can be written as $7 \times 7 \times 2 \times 2 = 49 \times 4 = 196$
3. 23×5 can be written as $2 \times 2 \times 2 \times 5 = 8 \times 5 = 40$
4. 3×44 can be written as $3 \times 4 \times 4 \times 4 = 3 \times 256 = 768$
5. 0×10^2 can be written as $0 \times 10 \times 10 = 0 \times 100 = 0$
6. 52×33 can be written as $5 \times 5 \times 3 \times 3 \times 3 = 25 \times 27 = 675$
7. 24×32 can be written as $2 \times 2 \times 2 \times 2 \times 3 \times 3 = 16 \times 9 = 144$
8. 32×10^4 can be written as $3 \times 3 \times 10 \times 10 \times 10 \times 10 = 9 \times 10000 = 90000$

Question 9. Simplify the following given below:

- $(-4)^3$
- $(-3) \times (-2)^3$
- $(-3)^2 \times (-5)^2$
- $(-2)^3 \times (-10)^3$

Solution:

1. On expansion of $(-4)^3$,

We get

$$-4 \times -4 \times -4 = -64$$

1. On expansion of $(-3) \times (-2)^3$

We get

$$-3 \times -2 \times -2 \times -2 = -3 \times -8 = 24$$

1. On expansion of $(-3)^2 \times (-5)^2$

$$\text{We get } -3 \times -3 \times -5 \times -5 = 9 \times 25 = 225$$

1. On expansion of $(-2)^3 \times (-10)^3$

We get

$$-2 \times -2 \times -2 \times -10 \times -10 \times -10 = -8 \times -1000 = 8000$$

Question 10. Compare the following numbers:

- 2.7×10^{12} and 1.5×10^8
- 1. b) 4×10^{14} and 3×10^{17}

Solution:

a) The above equation is given as 2.7×10^{12} and 1.5×10^8

On comparison made for the exponents of base 10, we get

$$2.7 \times 10^{12} > 1.5 \times 10^8$$

1. b) The above equation is given as 4×10^{14} and 3×10^{17}

On comparing the exponents of base 10, we will clearly find that

$$4 \times 10^{14} < 3 \times 10^{17}$$

Question 11. What are the laws of the exponent?

Solution:

The laws of exponents make the expression of the exponential form simplified.

As per product law,

- When the bases are the same and the exponents are different then the product law is expressed as

$$a^m \times a^n = a^{m+n}$$

in this a is a rational number while m and n are the natural numbers

- The other aspect of product law is when the bases are different but the exponents are the same then the product law is:

$$a^n \times b^n = (ab)^n$$

here a and b are the rational numbers while n is a natural number.

As per quotient law,

- When the bases are the same but the exponents are different then as per quotient law,

$$a^m \div a^n = a^{m-n}$$

here a is the rational number and m and n are the natural numbers.

- When the bases are different and the exponents are the same, then the quotient law is $a^n \div b^n = (a/b)^n$. here a and b are the rational number and n is a natural number.

As per power law,

If a is a rational number and m, n are natural numbers then according to the power law, $(a^m)^n = a^{mn}$

Question 12. Simplify the given equation below and write the answer in the exponential form. Use laws of exponents.

- $3^2 \times 3^4 \times 3^8$
- $6^{15} \div 6^{10}$
- $a^3 \times a^2$
- $7^x \times 7^2$
- $(5^2)^3 \div 5^3$
- $2^5 \times 5^5$
- $b^4 \times c^4$
- $(3^4)^3$
- $(2^{20} \div 2^{15}) \times 2^3$

Solution:

1. $3^2 \times 3^4 \times 3^8$ will be written as $(3)^{2+4+8} = 3^{14}$

The above is related to the rule of multiplying the powers when they have the same base

Like $a^m \times a^n = a^{m+n}$

1. $6^{15} \div 6^{10}$ will be written as $(6)^{15-10} = 6^5$.

The above is related to the rule of dividing the power which have the same base.

Like $a^m \div a^n = a^{m-n}$

1. $a^3 \times a^2$ will be written as $(a)^{3+2} = a^5$.

The above is related to the rule of multiplying the powers when they have the same base

Like $a^m \times a^n = a^{m+n}$

1. $7^x \times 7^2$ will be written as $7^{(x+2)}$, this is in accordance with the rule of multiplying the powers when they have the same base, like $a^m \times a^n = a^{m+n}$

1. $(52)^3 \div 53$. In this the rule of power of as power will be followed, according to which

$$(am)^n = a^n m^n$$

Following this, $(52)^3 \div 53$ will be written as:

$$(52)^3 = (5)^2 \times 3 = 56$$

Final equation here will be $56 \div 53$. To solve this, following the rule of dividing the power which have the same base is $a^m \div a^n = a^{m-n}$

$$= (5)^{6-3} = 5^3$$

1. $25 \times 55 = (2 \times 5)^5 = 105$. The rule of multiplying the power with the same exponent is applied here.

1. $b^4 \times c^4 = (b \times c)^4 = bc^4$. The rule of multiplying the power with the same exponents is applied here.

1. $(34)^3 = (3)^4 \times 3 = 312$. The rule of taking the power of as power is applied here.

1. $(220 \div 215) \times 23$

First of all, the rule of dividing the power with the same base will be applied,

So $(220 \div 215)$ will be further simplified as $(2)^{20-15} = 2^5$

After this,

The rule of multiplying the power with the same base will be applied

$$a^m \times a^n = a^{m+n}$$

So 25×23 will be simplified and written as

$$(2)^{5+3} = 2^8$$

Benefits of Solving Important Questions for Class 7 Maths Chapter 11

- **Concept Clarity:** Practicing important questions helps students understand fundamental concepts such as the laws of exponents, standard form, and negative powers.
- **Improved Problem-Solving Skills:** These questions challenge students to apply concepts in different ways, enhancing their analytical and logical thinking abilities.
- **Preparation for Exams:** Important questions are often modeled after exam-style problems, making them a valuable resource for scoring well in tests and exams.

- **Real-Life Applications:** Understanding exponents and powers equips students to deal with real-world scenarios involving large and small numbers, such as scientific notation and measurements.
- **Builds Confidence:** Regular practice of important questions boosts students confidence in tackling challenging problems and reinforces their understanding of the chapter.
- **Time Management:** Solving a variety of questions helps students learn to manage their time effectively during exams by improving their speed and accuracy.