

Collegedunia NCERT Notes

NCERT Revision Notes

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[Chapter 2 NCERT Book PDF](#) [Chapter 2 Notes](#)
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What this PDF covers

This PDF gives step-by-step answers for NCERT Class 8 Mathematics Part 1 Chapter 2. It covers exponential notation, products and quotients of powers, negative exponents, powers of 10, scientific notation, and linear versus exponential growth.

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Question

Which expression describes the thickness of a sheet of paper after it is folded 10 times, if the initial thickness is represented by v ?

SOLUTION

Concept used. Each fold doubles the thickness. After 10 folds, the multiplier is 2 multiplied by itself 10 times, so the expression is $2^{10}v$.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 2: Power Play.

1. After 1 fold, the thickness is $2v$.
2. After 2 folds, the thickness is $2 \times 2 \times v = 2^2v$.
3. After 10 folds, the multiplier is 2^{10} .
4. So the correct expression is $2^{10}v$.

Exam tip

Do not write $2^{10}v$. The exponent 10 means 2 is used as a factor ten times.

Final answer

$2^{10}v$, option (v).

Strategic angle. Power questions become easier when the operation is named first. Multiplication adds exponents, division subtracts them, and a power of a power multiplies them.

1. Read the question for the base, exponent and operation.
2. Choose the matching exponent rule before doing arithmetic.
3. Keep brackets around negative bases and fractional forms.
4. Simplify one line at a time so the power law stays visible.
5. Check the final answer by expanding a small part when possible.

For this question, the key is to keep the base and exponent separate. Once the correct rule is selected, the arithmetic is short. This avoids common mistakes such as adding bases or multiplying exponents in the wrong place.

Final answer

$2^{10}v$, option (v).

Question

Express $6 \times 6 \times 6 \times 6$, $y \times y$, $b \times b \times b \times b$, $5 \times 5 \times 7 \times 7 \times 7$, $2 \times 2 \times a \times a$, and $a \times a \times a \times c \times c \times c \times c \times d$ in exponential form.

SOLUTION

Concept used. Exponential notation groups repeated factors. The base is the repeated factor, and the exponent counts how many times it appears.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 2: Power Play.

1. $6 \times 6 \times 6 \times 6 = 6^4$.
2. $y \times y = y^2$.
3. $b \times b \times b \times b = b^4$.
4. $5 \times 5 \times 7 \times 7 \times 7 = 5^2 \times 7^3$.
5. $2 \times 2 \times a \times a = 2^2 a^2$.
6. $a \times a \times a \times c \times c \times c \times c \times d = a^3 c^4 d$.

Exam tip

Count each base separately when more than one factor repeats.

Final answer

$$6^4, y^2, b^4, 5^2 \times 7^3, 2^2 a^2, a^3 c^4 d.$$

EXPERT SOLUTION: Kabir Menon, M.Sc
Mathematics, IIT Madras

Strategic angle. Power questions become easier when the operation is named first. Multiplication adds exponents, division subtracts them, and a power of a power multiplies them.

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5. Check the final answer by expanding a small part when possible.

For this question, the key is to keep the base and exponent separate. Once the correct rule is selected, the arithmetic is short. This avoids common mistakes such as adding bases or multiplying exponents in the wrong place.

Final answer

$6^4, y^2, b^4, 5^2 \times 7^3, 2^2a^2, a^3c^4d.$

Question

Express 648, 405, 540 and 3600 as products of powers of their prime factors.

SOLUTION

Concept used. Prime factorisation writes a number using only prime factors. Repeated prime factors are then grouped with exponents.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 2: Power Play.

1. $648 = 2 \times 324 = 2^2 \times 162 = 2^3 \times 81 = 2^3 \times 3^4$.
2. $405 = 5 \times 81 = 5 \times 3^4$.
3. $540 = 54 \times 10 = (2 \times 3^3) \times (2 \times 5) = 2^2 \times 3^3 \times 5$.
4. $3600 = 36 \times 100 = (2^2 \times 3^2) \times (2^2 \times 5^2) = 2^4 \times 3^2 \times 5^2$.

Exam tip

Check by multiplying the grouped factors back once.

Final answer

$$648 = 2^3 3^4, 405 = 3^4 5, 540 = 2^2 3^3 5, 3600 = 2^4 3^2 5^2.$$

EXPERT SOLUTION: Aditi Rao, B.Ed
Mathematics, University of Mumbai

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For this question, the key is to keep the base and exponent separate. Once the correct rule is selected, the arithmetic is short. This avoids common mistakes such as adding bases or multiplying

exponents in the wrong place.

Final answer

$$648 = 2^3 3^4, 405 = 3^4 5, 540 = 2^2 3^3 5, 3600 = 2^4 3^2 5^2.$$

Question

Find the numerical values of 2×10^3 , $7^2 \times 2^3$, 3×4^4 , $(-3)^2 \times (-5)^2$, $3^2 \times 10^4$, and $(-2)^5 \times (-10)^6$.

SOLUTION

Concept used. Evaluate powers first, then multiply. A negative base raised to an even power becomes positive, and to an odd power remains negative.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 2: Power Play.

1. $2 \times 10^3 = 2 \times 1000 = 2000$.
2. $7^2 \times 2^3 = 49 \times 8 = 392$.
3. $3 \times 4^4 = 3 \times 256 = 768$.
4. $(-3)^2 \times (-5)^2 = 9 \times 25 = 225$.
5. $3^2 \times 10^4 = 9 \times 10000 = 90000$.
6. $(-2)^5 \times (-10)^6 = -32 \times 1000000 = -32000000$.

Exam tip

Keep brackets around a negative base before deciding the sign.

Final answer

2000, 392, 768, 225, 90000, -32000000 .

EXPERT SOLUTION: Pranav Iyer, M.Sc
Mathematics, IISc Bengaluru

Strategic angle. Power questions become easier when the operation is named first. Multiplication adds exponents, division subtracts them, and a power of a power multiplies them.

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2. Choose the matching exponent rule before doing arithmetic.
3. Keep brackets around negative bases and fractional forms.
4. Simplify one line at a time so the power law stays visible.
5. Check the final answer by expanding a small part when possible.

For this question, the key is to keep the base and exponent separate. Once the correct rule is selected, the arithmetic is short. This avoids common mistakes such as adding bases or multiplying exponents in the wrong place.

Final answer

2000, 392, 768, 225, 90000, -32000000 .

Question

The Stones that Shine puzzle gives 3^7 diamonds. Find the total number of diamonds.

SOLUTION

Concept used. The exponent 7 says that 3 is multiplied by itself seven times. We can use known partial products to keep the work short.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 2: Power Play.

1. The chapter computes $3^4 = 81$.
2. The remaining factor is $3^3 = 27$.
3. So $3^7 = 3^4 \times 3^3 = 81 \times 27$.
4. $81 \times 27 = 81 \times (20 + 7) = 1620 + 567 = 2187$.

Exam tip

Break a large power into powers whose values you already know.

Final answer

There are 2187 diamonds.

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3. Keep brackets around negative bases and fractional forms.
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5. Check the final answer by expanding a small part when possible.

For this question, the key is to keep the base and exponent separate. Once the correct rule is selected, the arithmetic is short. This avoids common mistakes such as adding bases or multiplying exponents in the wrong place.

Final answer

There are 2187 diamonds.

Question

Use $n^a \times n^b = n^{a+b}$ to compute 2^9 , 5^7 and 4^6 .

SOLUTION

Concept used. When the base is the same, multiplying powers means adding exponents. Then evaluate if a numerical value is needed.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 2: Power Play.

1. $2^9 = 2^5 \times 2^4 = 32 \times 16 = 512$.
2. $5^7 = 5^4 \times 5^3 = 625 \times 125 = 78125$.
3. $4^6 = 4^3 \times 4^3 = 64 \times 64 = 4096$.

Exam tip

Add exponents only when the base is identical.

Final answer

$2^9 = 512$, $5^7 = 78125$, $4^6 = 4096$.

Strategic angle. Power questions become easier when the operation is named first. Multiplication adds exponents, division subtracts them, and a power of a power multiplies them.

1. Read the question for the base, exponent and operation.
2. Choose the matching exponent rule before doing arithmetic.
3. Keep brackets around negative bases and fractional forms.
4. Simplify one line at a time so the power law stays visible.
5. Check the final answer by expanding a small part when possible.

For this question, the key is to keep the base and exponent separate. Once the correct rule is selected, the arithmetic is short. This avoids common mistakes such as adding bases or multiplying exponents in the wrong place.

Final answer

$$2^9 = 512, 5^7 = 78125, 4^6 = 4096.$$

Question

Write 8^6 , 7^{15} , 9^{14} , and 5^8 as a power of a power in at least two different ways.

SOLUTION

Concept used. The rule $(n^a)^b = n^{ab}$ lets us split the exponent into factor pairs.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 2: Power Play.

1. $8^6 = (8^2)^3 = (8^3)^2$.
2. $7^{15} = (7^3)^5 = (7^5)^3$.
3. $9^{14} = (9^2)^7 = (9^7)^2$.
4. $5^8 = (5^2)^4 = (5^4)^2$.

Exam tip

Choose factor pairs of the exponent, such as $6 = 2 \times 3$.

Final answer

$$8^6 = (8^2)^3 = (8^3)^2; 7^{15} = (7^3)^5 = (7^5)^3; 9^{14} = (9^2)^7 = (9^7)^2; 5^8 = (5^2)^4 = (5^4)^2.$$

Strategic angle. Power questions become easier when the operation is named first. Multiplication adds exponents, division subtracts them, and a power of a power multiplies them.

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2. Choose the matching exponent rule before doing arithmetic.
3. Keep brackets around negative bases and fractional forms.
4. Simplify one line at a time so the power law stays visible.
5. Check the final answer by expanding a small part when possible.

For this question, the key is to keep the base and exponent separate. Once the correct rule is selected, the arithmetic is short. This avoids common mistakes such as adding bases or multiplying exponents in the wrong place.

Final answer

$$8^6 = (8^2)^3 = (8^3)^2; 7^{15} = (7^3)^5 = (7^5)^3; 9^{14} = (9^2)^7 = (9^7)^2; 5^8 = (5^2)^4 = (5^4)^2.$$

Question

In the magical pond, lotuses double every day and the pond is full on day 30. On which day was it half full?

SOLUTION

Concept used. If a quantity doubles each day, then one day before it is full it must be half full.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 2: Power Play.

1. On day 30, the pond is fully covered.
2. The number of lotuses on day 30 is double the number on day 29.
3. So day 29 has exactly half the number of lotuses needed to fill the pond.
4. Therefore the pond was half full on day 29.

Exam tip

For doubling puzzles, work backward one step.

Final answer

The pond was half full on day 29.

EXPERT SOLUTION: Dev Patel, M.Sc
Applied Mathematics, IIT Bombay

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1. Read the question for the base, exponent and operation.
2. Choose the matching exponent rule before doing arithmetic.
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4. Simplify one line at a time so the power law stays visible.
5. Check the final answer by expanding a small part when possible.

For this question, the key is to keep the base and exponent separate. Once the correct rule is selected, the arithmetic is short. This avoids common mistakes such as adding bases or multiplying exponents in the wrong place.

Final answer

The pond was half full on day 29.

Question

Damayanti grows one lotus for 4 days in a doubling pond, then moves all lotuses to a tripling pond for 4 more days. How many lotuses are there? What if the order is reversed?

SOLUTION

Concept used. The final number is a product of the growth factors. Multiplication is commutative, so the order of doubling and tripling does not change the final product.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 2: Power Play.

1. After 4 days in the doubling pond, the number is $1 \times 2^4 = 16$.
2. After 4 more days in the tripling pond, the number is $2^4 \times 3^4$.
3. Using $m^a n^a = (mn)^a$, we get $2^4 \times 3^4 = (2 \times 3)^4 = 6^4$.
4. $6^4 = 1296$.
5. If the order is reversed, the product is $3^4 \times 2^4$, which is the same.

Exam tip

Changing the order of multiplication does not change the product.

Final answer

There are 1296 lotuses in either order.

EXPERT SOLUTION: Ishita Roy, M.Sc
Mathematics, Jadavpur University

Strategic angle. Power questions become easier when the operation is named first. Multiplication adds exponents, division subtracts them, and a power of a power multiplies them.

1. Read the question for the base, exponent and operation.
2. Choose the matching exponent rule before doing arithmetic.
3. Keep brackets around negative bases and fractional forms.
4. Simplify one line at a time so the power law stays visible.
5. Check the final answer by expanding a small part when possible.

For this question, the key is to keep the base and exponent separate. Once the correct rule is selected, the arithmetic is short. This avoids common mistakes such as adding bases or multiplying exponents in the wrong place.

Final answer

There are 1296 lotuses in either order.

Question

Use the same-exponent rule to compute $2^5 \times 5^5$ and simplify $\frac{10^4}{5^4}$.

SOLUTION

Concept used. For the same exponent, multiply or divide the bases first: $m^a n^a = (mn)^a$ and $m^a / n^a = (m/n)^a$.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 2: Power Play.

1. $2^5 \times 5^5 = (2 \times 5)^5 = 10^5 = 100000$.
2. $\frac{10^4}{5^4} = \left(\frac{10}{5}\right)^4 = 2^4$.
3. $2^4 = 16$.

Exam tip

The bases can combine first only because the exponents match.

Final answer

$2^5 \times 5^5 = 10^5 = 100000$, and $\frac{10^4}{5^4} = 2^4 = 16$.

Strategic angle. Power questions become easier when the operation is named first. Multiplication adds exponents, division subtracts them, and a power of a power multiplies them.

1. Read the question for the base, exponent and operation.
2. Choose the matching exponent rule before doing arithmetic.
3. Keep brackets around negative bases and fractional forms.
4. Simplify one line at a time so the power law stays visible.
5. Check the final answer by expanding a small part when possible.

For this question, the key is to keep the base and exponent separate. Once the correct rule is selected, the arithmetic is short. This avoids common mistakes such as adding bases or multiplying exponents in the wrong place.

Final answer

$$2^5 \times 5^5 = 10^5 = 100000, \text{ and } \frac{10^4}{5^4} = 2^4 = 16.$$

Question

What is $2^{100} \div 2^{25}$ in powers of 2?

SOLUTION

Concept used. When dividing powers with the same non-zero base, subtract the exponents.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 2: Power Play.

1. The base is the same, 2.
2. Use $n^a \div n^b = n^{a-b}$.
3. $2^{100} \div 2^{25} = 2^{100-25}$.
4. So the result is 2^{75} .

Exam tip

Subtract exponents only for division with the same base.

Final answer

2^{75} .

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1. Read the question for the base, exponent and operation.
2. Choose the matching exponent rule before doing arithmetic.
3. Keep brackets around negative bases and fractional forms.
4. Simplify one line at a time so the power law stays visible.
5. Check the final answer by expanding a small part when possible.

For this question, the key is to keep the base and exponent separate. Once the correct rule is selected, the arithmetic is short. This avoids common mistakes such as adding bases or multiplying exponents in the wrong place.

Final answer

2^{75} .

Question

Why is $x^0 = 1$ for $x \neq 0$?

SOLUTION

Concept used. The zero exponent is defined so that the division rule for powers stays consistent.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 2: Power Play.

1. For any non-zero x , $x^a \div x^a = 1$.
2. Using the exponent rule, $x^a \div x^a = x^{a-a} = x^0$.
3. Both expressions describe the same division.
4. So $x^0 = 1$, provided $x \neq 0$.

Exam tip

The base cannot be zero because division by zero is not allowed.

Final answer

$x^0 = 1$ for every non-zero x .

Strategic angle. Power questions become easier when the operation is named first. Multiplication adds exponents, division subtracts them, and a power of a power multiplies them.

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5. Check the final answer by expanding a small part when possible.

For this question, the key is to keep the base and exponent separate. Once the correct rule is selected, the arithmetic is short. This avoids common mistakes such as adding bases or multiplying exponents in the wrong place.

Final answer

$$x^0 = 1 \text{ for every non-zero } x.$$

Question

Write equivalent forms of 2^{-4} , 10^{-5} , $(-7)^{-2}$, $(-5)^{-3}$, and 10^{-100} .

SOLUTION

Concept used. A negative exponent means reciprocal: $n^{-a} = 1/n^a$, for $n \neq 0$.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 2: Power Play.

1. $2^{-4} = \frac{1}{2^4} = \frac{1}{16}$.
2. $10^{-5} = \frac{1}{10^5}$.
3. $(-7)^{-2} = \frac{1}{(-7)^2} = \frac{1}{49}$.
4. $(-5)^{-3} = \frac{1}{(-5)^3} = -\frac{1}{125}$.
5. $10^{-100} = \frac{1}{10^{100}}$.

Exam tip

Keep brackets around a negative base before deciding the sign.

Final answer

$\frac{1}{16}$, $\frac{1}{10^5}$, $\frac{1}{49}$, $-\frac{1}{125}$, $\frac{1}{10^{100}}$.

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1. Read the question for the base, exponent and operation.
2. Choose the matching exponent rule before doing arithmetic.
3. Keep brackets around negative bases and fractional forms.
4. Simplify one line at a time so the power law stays visible.
5. Check the final answer by expanding a small part when possible.

For this question, the key is to keep the base and exponent separate. Once the correct rule is selected, the arithmetic is short. This avoids common mistakes such as adding bases or multiplying exponents in the wrong place.

Final answer

$$\frac{1}{16}, \frac{1}{10^5}, \frac{1}{49}, -\frac{1}{125}, \frac{1}{10^{100}}.$$

Question

Simplify $2^{-4} \times 2^7$, $3^2 \times 3^{-5} \times 3^6$, $p^3 \times p^{-10}$, $2^4 \times (-4)^{-2}$, **and** $8^p \times 8^q$.

SOLUTION

Concept used. For the same base, add exponents while multiplying. Negative exponents are allowed in the same rule.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 2: Power Play.

1. $2^{-4} \times 2^7 = 2^{-4+7} = 2^3 = 8.$
2. $3^2 \times 3^{-5} \times 3^6 = 3^{2-5+6} = 3^3 = 27.$
3. $p^3 \times p^{-10} = p^{-7} = \frac{1}{p^7}$, for $p \neq 0.$
4. $2^4 \times (-4)^{-2} = 16 \times \frac{1}{16} = 1.$
5. $8^p \times 8^q = 8^{p+q}.$

Exam tip

Use reciprocal form when a final exponent is negative.

Final answer

8, 27, p^{-7} , 1, 8^{p+q} .

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For this question, the key is to keep the base and exponent separate. Once the correct rule is selected, the arithmetic is short. This avoids common mistakes such as adding bases or multiplying exponents in the wrong place.

Final answer

8, 27, p^{-7} , 1, 8^{p+q} .

Question

Using the power line of 4, how many times larger than 4^{-2} is 4^2 ?

SOLUTION

Concept used. To compare two powers with the same base by division, subtract the exponents.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 2: Power Play.

1. The comparison is $4^2 \div 4^{-2}$.
2. Use $4^a \div 4^b = 4^{a-b}$.
3. $4^2 \div 4^{-2} = 4^{2-(-2)} = 4^4$.
4. $4^4 = 256$.

Exam tip

Subtracting a negative exponent increases the exponent.

Final answer

4^2 is 256 times larger than 4^{-2} .

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For this question, the key is to keep the base and exponent separate. Once the correct rule is selected, the arithmetic is short. This avoids common mistakes such as adding bases or multiplying exponents in the wrong place.

Final answer

4^2 is 256 times larger than 4^{-2} .

Question

Use powers of 10 to write 172, 5642, 6374 and 561.903 in expanded form.

SOLUTION

Concept used. Each digit is multiplied by a power of 10 according to its place value. Decimal places use negative powers of 10.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 2: Power Play.

1. $172 = 1 \times 10^2 + 7 \times 10^1 + 2 \times 10^0$.
2. $5642 = 5 \times 10^3 + 6 \times 10^2 + 4 \times 10^1 + 2 \times 10^0$.
3. $6374 = 6 \times 10^3 + 3 \times 10^2 + 7 \times 10^1 + 4 \times 10^0$.
4. $561.903 = 5 \times 10^2 + 6 \times 10^1 + 1 \times 10^0 + 9 \times 10^{-1} + 0 \times 10^{-2} + 3 \times 10^{-3}$.

Exam tip

The tenths place is 10^{-1} ,
hundredths is 10^{-2} , and
thousandths is 10^{-3} .

Final answer

The expanded forms are listed above with powers of 10.

EXPERT SOLUTION: Rahul Bansal, M.Sc
Mathematics, Panjab University

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For this question, the key is to keep the base and exponent separate. Once the correct rule is selected, the arithmetic is short. This avoids common mistakes such as adding bases or multiplying

exponents in the wrong place.

Final answer

The expanded forms are listed above with powers of 10.

Question

Write 59853, 65950, 3430000 and 70040000000 in standard scientific form.

SOLUTION

Concept used. Scientific notation writes a number as $x \times 10^y$, where $1 \leq x < 10$. Move the decimal point and count the moves.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 2: Power Play.

1. $59853 = 5.9853 \times 10^4$.
2. $65950 = 6.595 \times 10^4$.
3. $3430000 = 3.43 \times 10^6$.
4. $70040000000 = 7.004 \times 10^{10}$.

Exam tip

The coefficient must be at least 1 and less than 10.

Final answer

5.9853×10^4 , 6.595×10^4 , 3.43×10^6 , 7.004×10^{10} .

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3. Keep brackets around negative bases and fractional forms.
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5. Check the final answer by expanding a small part when possible.

For this question, the key is to keep the base and exponent separate. Once the correct rule is selected, the arithmetic is short. This avoids common mistakes such as adding bases or multiplying exponents in the wrong place.

Final answer

5.9853×10^4 , 6.595×10^4 , 3.43×10^6 , 7.004×10^{10} .

Question

Which distance is the smallest: Sun to Saturn 1.4335×10^{12} m, Saturn to Uranus 1.439×10^{12} m, or Sun to Earth 1.496×10^{11} m?

SOLUTION

Concept used. In scientific notation, first compare exponents. A number with exponent 11 is ten times smaller than a similar coefficient with exponent 12.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 2: Power Play.

1. Sun to Saturn has exponent 12.
2. Saturn to Uranus also has exponent 12.
3. Sun to Earth has exponent 11.
4. Since 10^{11} is one-tenth of 10^{12} , the Sun to Earth distance is smallest.

Exam tip

Compare the exponent before comparing the coefficient.

Final answer

The Sun to Earth distance is the smallest.

EXPERT SOLUTION: Omkar Kulkarni,
M.Sc Mathematics, Savitribai Phule Pune
University

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5. Check the final answer by expanding a small part when possible.

For this question, the key is to keep the base and exponent separate. Once the correct rule is selected, the arithmetic is short. This avoids common mistakes

such as adding bases or multiplying exponents in the wrong place.

Final answer

The Sun to Earth distance is the smallest.

Question

Estimate the worth of jaggery equal to Roxie's weight and wheat equal to Estu's weight using reasonable assumptions.

SOLUTION

Concept used. This is a modeling question. State assumptions, write the relationship, then multiply.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 2: Power Play.

1. Assume Roxie weighs 45 kg and jaggery costs rupees 70 per kg.
2. Worth of jaggery = 45×70 = rupees 3150.
3. Assume Estu weighs 50 kg and wheat costs rupees 50 per kg.
4. Worth of wheat = 50×50 = rupees 2500.
5. Different reasonable assumptions can give slightly different answers.

Exam tip

In estimation questions, the method matters as much as the exact assumed numbers.

Final answer

With these assumptions, jaggery is worth rupees 3150 and wheat is worth rupees 2500.

EXPERT SOLUTION: Zoya Siddiqui, M.Sc Mathematics, Aligarh Muslim University

Strategic angle. Power questions become easier when the operation is named first. Multiplication adds exponents, division subtracts them, and a power of a power multiplies them.

1. Read the question for the base, exponent and operation.
2. Choose the matching exponent rule before doing arithmetic.
3. Keep brackets around negative bases and fractional forms.
4. Simplify one line at a time so the power law stays visible.
5. Check the final answer by expanding

a small part when possible.

For this question, the key is to keep the base and exponent separate. Once the correct rule is selected, the arithmetic is short. This avoids common mistakes such as adding bases or multiplying exponents in the wrong place.

Final answer

With these assumptions, jaggery is worth rupees 3150 and wheat is worth rupees 2500.

Question

How many steps would a ladder need to reach the Moon if the Earth-Moon distance is 384400 km and the gap between steps is 20 cm?

SOLUTION

Concept used. This is linear growth. Each step adds the same distance, so divide the total distance by the step size after converting units.

Source anchor

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1. $384400 \text{ km} = 384400 \times 100000 \text{ cm}$.
2. So the distance is 38440000000 cm.
3. Each step covers 20 cm.
4. Number of steps $= 38440000000 \div 20 = 1922000000$.
5. This is 192 crore 20 lakh steps.

Exam tip

Convert to the same unit before dividing.

Final answer

The ladder would need 1,922,000,000 steps, or 192 crore 20 lakh steps.

EXPERT SOLUTION: Harsh Mehta, B.Sc Mathematics, St Xavier's College

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Final answer

The ladder would need
1,922,000,000 steps, or 192 crore
20 lakh steps.

Question

Give examples of linear growth and exponential growth.

SOLUTION

Concept used. Linear growth adds a fixed amount each time. Exponential growth multiplies by a fixed factor each time.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 2: Power Play.

1. A ladder climb is linear growth if every step adds 20 cm.
2. Saving the same amount of money every week is also linear growth.
3. Paper folding is exponential growth because the thickness doubles each fold.
4. Lotuses doubling every day is another exponential growth example.

Exam tip

Ask whether the change is by adding or by multiplying.

Final answer

Linear growth examples: ladder steps and fixed weekly savings.
Exponential growth examples: paper folding and lotuses doubling daily.

EXPERT SOLUTION: Naina Pillai, M.Ed
Mathematics, University of Kerala

Strategic angle. Power questions become easier when the operation is named first. Multiplication adds exponents, division subtracts them, and a power of a power multiplies them.

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Final answer

Linear growth examples: ladder steps and fixed weekly savings.

Exponential growth examples: paper folding and lotuses doubling daily.

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