CLASS 8 MATHS NCERT SOLUTIONS

# NCERT Solutions for Class 8 Maths Chapter 2: Power Play – Free PDF Download

Chapter 2 — Power Play — introduces exponents: writing repeated multiplication as powers, the laws of exponents (product, quotient, power-of-a-power, power-of-a-product, zero and negative exponents), and using powers of 10 to express and compare very large or very small numbers in standard (scientific) form. The...

## Contents

Chapter 2 — Power Play — introduces exponents: writing repeated multiplication as powers, the laws of exponents (product, quotient, power-of-a-power, power-of-a-product, zero and negative exponents), and using powers of 10 to express and compare very large or very small numbers in standard (scientific) form. The chapter has two Figure It Out blocks (3 questions + 14 questions = 17 in all). Below are complete, verified answers, sourced directly from the official NCERT PDF and independently recalculated. These Class 8 Mathematics Chapter 2 solutions are also useful as quick revision notes before exams.

# NCERT Solutions for Class 8 Maths Chapter 2: Power Play

## Figure It Out — Block 1 (Section 2.2)

**1. Express in exponential form: (i) 6×6×6×6 (ii) y×y (iii) b×b×b×b (iv) 5×5×7×7×7 (v) 2×2×a×a (vi) a×a×a×c×c×c×c×d**
(i) $6^4$ (ii) $y^2$ (iii) $b^4$ (iv) $5^2\times7^3$ (v) $2^2\times a^2$ (vi) $a^3\times c^4\times d$

**2. Express as a product of powers of prime factors: (i) 648 (ii) 405 (iii) 540 (iv) 3600**
(i) $2^3\times3^4$ (ii) $3^4\times5$ (iii) $2^2\times3^3\times5$ (iv) $2^4\times3^2\times5^2$

**3. Write the numerical value: (i) $2\times10^3$ (ii) $7^2\times2^3$ (iii) $3\times4^4$ (iv) $(-3)^2\times(-5)^2$ (v) $3^2\times10^4$ (vi) $(-2)^5\times(-10)^6$**
(i) 2000 (ii) 392 (iii) 768 (iv) 225 (v) 90,000 (vi) –32,000,000

## Figure It Out — Block 2 (Sections 2.4–2.5)

**1. Find the units digit in $2^{224} \div 4^{32}$ (hint: $4=2^2$).**
$4^{32} = 2^{64}$, so $2^{224}\div2^{64} = 2^{160}$. Units digits of powers of 2 cycle every 4 (2,4,8,6); 160÷4 is exact, so the units digit is **6**.

**2. 5 bottles per container, one new container each day — bottles after 40 days?**
40×5 = **200** (= $2\times10^2$).

**3. Write as a product of two or more powers, three different ways: (i) $64^3$ (ii) $192^8$ (iii) $32^{-5}$**
(i) $64^3 = 2^{10}\times2^8 = 4^5\times4^4 = 8^3\times8^3$ (all = $2^{18}$). (ii) $192^8 = 2^{48}\times3^8 = 2^{40}\times2^8\times3^8 = 2^{40}\times6^8$. (iii) $32^{-5} = 2^{-10}\times2^{-15} = 2^{-5}\times2^{-20} = 4^{-12}\times2^{-1}$.

**4. Always True / Only Sometimes True / Never True: (i) Cube numbers are also square numbers. (ii) Fourth powers are also square numbers. (iii) The fifth power of a number is divisible by the cube of that number. (iv) The product of two cube numbers is a cube number. (v) $q^{46}$ is both a 4th power and a 6th power (q prime).**
(i) **Only Sometimes True** (true only for 6th powers, e.g. $64=4^3=8^2$). (ii) **Always True** ($n^4=(n^2)^2$). (iii) **Always True** ($n^5=n^3\cdot n^2$). (iv) **Always True** ($a^3b^3=(ab)^3$). (v) **Never True** — needs the exponent to be a multiple of lcm(4,6)=12; 46 isn't divisible by 4 or 6.

**5. Simplify: (i) $10^{-2}\times10^{-5}$ (ii) $5^7\div5^4$ (iii) $9^{-7}\div9^4$ (iv) $(13^{-2})^{-3}$ (v) $m^5n^{12}(mn)^9$**
(i) $10^{-7}$ (ii) $5^3$ (iii) $9^{-11}$ (iv) $13^6$ (v) $m^{14}n^{21}$

**6. If $12^2=144$, find: (i) $(1.2)^2$ (ii) $(0.12)^2$ (iii) $(0.012)^2$ (iv) $120^2$**
(i) 1.44 (ii) 0.0144 (iii) 0.000144 (iv) 14,400

**7. Circle the numbers that are equal: $2^4\times3^6$, $6^4\times3^2$, $6^{10}$, $18^2\times6^2$, $6^{24}$**
$2^4\times3^6 = 6^4\times3^2 = 18^2\times6^2 =$ **11,664** (all equal). $6^{10}$ and $6^{24}$ are different values.

**8. Which is greater? (i) $4^3$ or $3^4$ (ii) $2^8$ or $8^2$ (iii) $100^2$ or $2^{100}$**
(i) $3^4=81 > 4^3=64 \rightarrow$ **$3^4$**. (ii) $2^8=256 > 8^2=64 \rightarrow$ **$2^8$**. (iii) $2^{100}$ ($\approx 1.27\times10^{30}$) is vastly greater $\rightarrow$ **$2^{100}$**.

**9. A dairy needs unique IDs for 8.5 billion milk packets/year using digits 0–9. How many digits needed?**
$10^9$ is too small; $10^{10} \geq 8.5\times10^9 \rightarrow$ at least **10 digits**.

**10. 64 is both a square ($8^2$) and a cube ($4^3$). Are there other such numbers? What's the rule?**
Yes, infinitely many — any 6th power $n^6$ is both a square $[(n^3)^2]$ and a cube $[(n^2)^3]$: 1, 64, 729, 4096, 15625…

**11. A 5-character passcode uses 26 letters + 10 digits. How many possible codes?**
$36^5$ = **60,466,176**.

**12. World sheep population $\approx10^9$, goat population $\approx10^9$. Which expression(s) give the total? Options: $20^9$, $10^{11}$, $10^{10}$, $10^{18}$, $2\times10^9$, $10^9+10^9$**
**$2\times10^9$** and **$10^9+10^9$** are correct (both equal the same value); the others are not.

**13. Calculate and express in scientific notation: (i) total clothing if everyone owns 30 pieces (world population $\approx8.2\times10^9$) (ii) total honeybees ($\approx10^8$ colonies × 50,000 bees) (iii) total bacteria in all humans (≈38 trillion/person) (iv) lifetime seconds spent eating (state your assumptions)**
(i) $8.2\times10^9\times30$ = **$2.46\times10^{11}$** pieces. (ii) $10^8\times5\times10^4$ = **$5.0\times10^{12}$** bees. (iii) $38\times10^{12}\times8.2\times10^9$ = **$3.116\times10^{23}$** bacteria. (iv) Using 1 hour/day, 70-year lifespan: $3600\times365\times70 \approx$ **$9.198\times10^7$** seconds (reasonable alternative assumptions will give a different but equally valid figure — state your assumptions clearly).

**14. What was the date one billion ($10^9$) seconds ago?**
$10^9$ seconds ÷ 31,557,600 seconds/year ≈ **31.7 years** before today — work this out from today's date (this is a live, date-dependent calculation, not a fixed answer).

## Selected Math Talk & Try This (In-text) Highlights

**Paper-folding: thickness after 10 folds, starting thickness v?**
**$2^{10}$v** — each fold doubles the thickness, so n folds give $2^n$v.

**Is $(-1)^5$ positive or negative? What about $(-1)^{56}$?**
$(-1)^5$ = **−1** (odd exponent keeps the sign); $(-1)^{56}$ = **+1** (even exponent gives a positive result).

**What is $0^2$, $0^5$? What is $0^n$ in general?**
$0^2=0$, $0^5=0$; **$0^n=0$** for every positive integer n. ($0^0$ itself is left undefined.)

**Simplify $10^4/5^4$ using the power-of-a-quotient rule.**
$(10\div5)^4 = 2^4$ = **16**.

**Roxie has 7 dresses, 2 hats, 3 pairs of shoes — how many outfit combinations?**
7×2×3 = **42** combinations.

**Express 59,853; 65,950; 34,30,000; 70,04,00,00,000 in standard (scientific) form.**
$5.9853\times10^4$; $6.595\times10^4$; $3.43\times10^6$; $7.004\times10^{10}$.

## Why This Chapter Matters

Exponent laws and scientific notation are used constantly afterward — in expressing large/small measurements in science, in the Baudhayana–Pythagoras Theorem chapter (Part 2), and in algebra, where powers of variables follow the exact same rules introduced here.

## Class 8 Mathematics Chapter 2 – Notes and Extra Questions

Along with these NCERT Solutions, students can also use the Class 8 Mathematics Chapter 2 Extra Questions and Class 8 Mathematics Chapter 2 Revision Notes for quick revision and extra practice.