CLASS 8 MATHS NCERT SOLUTIONS

NCERT Solutions for Class 8 Maths Chapter 6: We Distribute, Yet Things Multiply – Free PDF Download

Chapter 6 — We Distribute, Yet Things Multiply — extends the distributive property of multiplication over addition to algebra: expanding products of binomials and multi-term expressions term by term, and building three key identities — (a+b)2 = a2+2ab+b2, (a–b)2 = a2–2ab+b2, and (a+b)(a–b) = a2–b2 — ...

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Chapter 6 — We Distribute, Yet Things Multiply — extends the distributive property of multiplication over addition to algebra: expanding products of binomials and multi-term expressions term by term, and building three key identities — $(a+b)^2 = a^2+2ab+b^2$, $(a–b)^2 = a^2–2ab+b^2$, and $(a+b)(a–b) = a^2–b^2$ — for fast mental arithmetic, number puzzles, and geometric area problems. The chapter has three Figure It Out blocks totalling 20 questions. Below are complete, verified answers, sourced directly from the official NCERT PDF and independently recalculated. These Class 8 Mathematics Chapter 6 solutions are also useful as quick revision notes before exams.

NCERT Solutions for Class 8 Maths Chapter 6: We Distribute, Yet Things Multiply

Figure It Out — Section 6.1: Some Properties of Multiplication (5 Questions)

1. In a multiplication grid, the middle number of a 3×3 frame is pq (columns headed p–1, p, p+1; rows headed q–1, q, q+1). Write expressions for the other 8 numbers in the grid.
Top row: (p–1)(q–1), p(q–1), (p+1)(q–1). Middle row: (p–1)q, **pq**, (p+1)q. Bottom row: (p–1)(q+1), p(q+1), (p+1)(q+1).

2. Expand the following products: (i) (3+u)(v–3) (ii) ⅔(15+6a) (iii) (10a+b)(10c+d) (iv) (3–x)(x–6) (v) (–5a+b)(c+d) (vi) (5+z)(y+9).
(i) 3v–9+uv–3u. (ii) 10+4a. (iii) 100ac+10ad+10bc+bd. (iv) $–x^2+9x–18$. (v) –5ac–5ad+bc+bd. (vi) 5y+45+yz+9z.

3. Find 3 examples where the product of two numbers stays the same when one is increased by 2 and the other decreased by 4.
Setting ab=(a+2)(b–4) gives b=2a+4. So **(1,6), (2,8), (3,10)** all work — e.g. 1×6=6 and 3×2=6.

4. Expand (i) $(a+ab–3b^2)(4+b)$ (ii) (4y+7)(y+11z–3).
(i) $4a+5ab–12b^2+ab^2–3b^3$. (ii) $4y^2+44yz–5y+77z–21$.

5. Expand (a–b)(a+b), $(a–b)(a^2+ab+b^2)$, and $(a–b)(a^3+a^2b+ab^2+b^3)$. What pattern emerges, and what's the next identity?
They simplify to $a^2–b^2$, $a^3–b^3$, and $a^4–b^4$ respectively. Pattern: $\mathbf{(a–b)(a^n+a^{n–1}b+...+b^n) = a^{n+1}–b^{n+1}}$. Next: $(a–b)(a^4+a^3b+a^2b^2+ab^3+b^4) = a^5–b^5$, verified by expansion.

Figure It Out — Section 6.2: Special Cases of the Distributive Property (4 Questions)

1. Which is greater: $(a–b)^2$ or $(b–a)^2$? Justify.
They are equal — both expand to $a^2+b^2–2ab$, since squaring removes the sign of the difference.

2. Express 100 as the difference of two squares.
Using $a^2–b^2=(a+b)(a–b)=100$ with a+b=50, a–b=2 gives a=26, b=24. $\mathbf{26^2–24^2 = 676–576 = 100}$.

3. Find 406^2, 72^2, 145^2, 1097^2, and 124^2 using the identities learned.
$406^2=(400+6)^2=$**164836**. $72^2=(50+22)^2=$**5184**. $145^2=(150–5)^2=$**21025**. $1097^2=(1100–3)^2=$**1203409**. $124^2=(100+24)^2=$**15376**.

4. Do $2(a^2+b^2)=(a+b)^2+(a–b)^2$ and $a^2–b^2=(a+b)(a–b)$ hold only for counting numbers, or also for negative integers and fractions?
Both identities hold for all three cases — counting numbers, negative integers, and fractions — because they are proved by pure algebraic expansion, which never assumes a sign or type of number. E.g.

with a=−4, b=−2: LHS=2(16+4)=40, RHS=$(-6)^2+(-2)^2$=40.

Figure It Out — Sections 6.3 & 6.4: Mind the Mistake / All Ways Lead to the Bay (11 Questions)

1. Compute using the suggested identity: (i) 46^2 (ii) 397×403 (iii) 91^2 (iv) 43×45.
(i) $46^2=(40+6)^2=$**2116**. (ii) $397\times403=(400-3)(400+3)=400^2-3^2=$**159991**. (iii) $91^2=(100-9)^2=$**8281**. (iv) $43\times45=(44-1)(44+1)=44^2-1=$**1935**.

2. Use an identity or the distributive property to find: (i) (p−1)(p+11) (ii) (3a−9b)(3a+9b) (iii) −(2y+5)(3y+4) (iv) $(6x+5y)^2$ (v) $(2x-½)^2$ (vi) 7p×3r×(p+2).
(i) $p^2+10p-11$. (ii) $9a^2-81b^2$. (iii) $-6y^2-23y-20$. (iv) $36x^2+60xy+25y^2$. (v) $4x^2-2x+¼$. (vi) $21p^2r+42pr$.

3. Identify the correct algebraic expression: (i) two more than a square number (ii) sum of squares of two consecutive numbers.
(i) **s^2+2**. (ii) **$m^2+(m+1)^2$**.

4. In a 2×2 square of calendar dates, find the products along each diagonal. What do you notice, and why?
The two diagonal products always differ by **7**. Labelling the square n, n+1 (top) and n+7, n+8 (bottom), the diagonals give $n(n+8)=n^2+8n$ and $(n+1)(n+7)=n^2+8n+7$ — a difference of exactly 7, since calendar rows are 7 apart.

5. Verify which statements are true: (i) (k+1)(k+2)−(k+3) is always a multiple of 2 (ii) (2q+1)(2q−3) is a multiple of 4 (iii) squares of even numbers are multiples of 4, and squares of odd numbers are 1 more than a multiple of 8 (iv) $(6n+2)^2-(4n+3)^2$ is 5 less than a square number.
(i) Expands to k^2+2k-1, which is **not** always even (k=1 gives 2, even; k=2 gives 7, odd) — **false**. (ii) Expands to $4q^2-4q-3$, which is always odd — **false**. (iii) **True** for both parts (e.g. $6^2=36=4\times9$; $7^2=49=8\times6+1$). (iv) Simplifies to $20n^2-16n-5$, which is not generally 5 less than a perfect square — **false** in general.

6. A number leaves remainder 3 when divided by 7, another leaves remainder 5. Find the remainder when their sum, difference, and product are divided by 7.
With x=7a+3, y=7b+5: sum's remainder is **1** (3+5=8=7+1), difference's remainder is **5** (since −2≡5 mod 7), and product's remainder is **1** (3×5=15=14+1).

7. Square the middle of three consecutive numbers and subtract the product of the outer two. What pattern do you get, and how do you prove it algebraically?
The result is **always 1** (e.g. $8^2-7\times9=64-63=1$). Algebraically, with numbers a−1, a, a+1: $a^2-(a+1)(a-1) = a^2-(a^2-1) = 1$.

8. Add two numbers, then multiply by half their sum. Show this equals half the square of their sum.
$(a+b)\times½(a+b) = ½(a+b)^2$ — true by direct simplification.

9. Which is larger, without fully computing: (i) 14×26 or 16×24 (ii) 25×75 or 26×74?
(i) Writing 16×24 = (14+2)(26−2) = 14×26 + 2×10, so **16×24 is larger by 20**. (ii) Writing 26×74 = (25+1)(75−1) = 25×75 + 49, so **26×74 is larger by 49**.

10. A park has two square green plots of area g^2 sq ft each, surrounded by a walking path w ft wide. Find the area to be tiled.
Overall park area = $(4w+2g)(2w+g) = 8w^2+8wg+2g^2$. Subtracting the $2g^2$ green area leaves **($8w^2+8wg$) sq**

ft to be tiled.

11. For each growing pattern of unit squares: how many units are in Step 10, and what's the expression for Step y?
Pattern (a): Step y has $\mathbf{(y+2)^2}$ unit squares, so Step 10 has 12^2 = **144.** Pattern (b): Step y has $\mathbf{(y+1)^2+y}$ unit squares, so Step 10 has 11^2+10 = **131**.

Why This Chapter Matters

This chapter turns the distributive property into a toolkit — three reusable identities that make mental arithmetic, algebraic simplification, and later factorisation dramatically faster. Recognising when a product fits $(a+b)^2$, $(a–b)^2$, or (a+b)(a–b) is a skill used throughout higher algebra, from Class 9 polynomial factorisation to competitive-exam shortcuts.

Class 8 Mathematics Chapter 6 – Notes and Extra Questions

Along with these NCERT Solutions, students can also use the Class 8 Mathematics Chapter 6 Extra Questions and Class 8 Mathematics Chapter 6 Revision Notes for quick revision and extra practice.