CLASS 8 · MATHEMATICS

We Distribute, Yet Things Multiply

Sample paper · 15 questions · 22 marks

10 objective questions × 1 mark. Five written-response questions: 12 marks. Write your working where needed. Suggested time: 45 minutes. Answers and marking guidance follow the questions.

Original Evater practice material aligned with these school topics. Not an official NCERT paper or marking scheme. No automatic grading is implied.

Section A · Objective questions (10 marks)

1. 3(x + 5) expands to:

A. 3x + 5

B. 3x + 8

C. x + 15

D. 3x + 15

2. (a + b) squared equals:

A. a squared + b squared

B. a squared - 2ab + b squared

C. 2a + 2b

D. a squared + 2ab + b squared

3. Using (10 + 3) squared, the value of 13 squared is:

A. 109

B. 139

C. 196

D. 169

4. 102 x 98 can be computed as (100 + 2)(100 - 2), which equals:

A. 9,994

B. 9,900

C. 10,016

D. 9,996

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5. a squared - b squared factorises as:

A. (a - b) squared

B. (a + b) squared

C. (a + b)(a - b)

D. a squared + b squared

6. (x + 2)(x + 5) expands to:

A. x squared + 3x + 10

B. x squared + 7x + 7

C. x squared + 7x + 10

D. x squared + 10x + 7

7. The distributive property says that a(b + c) equals:

A. a + bc

B. ab + c

C. ab + ac

D. abc

8. Using (100 - 1) squared, the value of 99 squared is:

A. 9,901

B. 9,801

C. 9,701

D. 9,999

9. (a - b) squared equals:

A. a squared - 2ab + b squared

B. a squared + 2ab + b squared

C. a squared - b squared

D. a squared + 2ab - b squared

10. 5(2 x - 3) expands to:

A. 10x - 3

B. 10x - 15

C. 2x - 15

D. 7x - 15

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Section B · Written responses (12 marks)

Attempt all five. Use a separate sheet if you need more space. The marks for each question are shown.

11. Expand (x + 4) squared and verify your expansion by substituting x = 1. [2 marks]

12. Use the identity (a + b)(a - b) = a squared - b squared to compute 53 x 47. [2 marks]

13. A student writes (x + 3) squared = x squared + 9. Point out the mistake and give the correct expansion. [2 marks]

14. Show that (a + b) squared - (a - b) squared = 4 ab, and verify it for a = 5, b = 2. [3 marks]

15. For x >0, a rectangle measures (x + 3) cm by (x + 2) cm. Split it into four smaller rectangles, write the area of each piece, and hence express the total area as an expanded expression. [3 marks]

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Answers & marking guidance

Use these after attempting the paper. Accept equivalent correct reasoning and sensible units. These are Evater model answers, not an official marking scheme.

Section A · 1 mark each

1. D — By the distributive property, 3(x + 5) = 3 x + 3 x 5 = 3 x + 15.

2. D — (a + b)(a + b) = a squared + ab + ba + b squared = a squared + 2 ab + b squared; the middle term 2 ab is essential.

3. D — 13 squared = 100 + 2 x 10 x 3 + 9 = 100 + 60 + 9 = 169.

4. D — (100 + 2)(100 - 2) = 100 squared - 2 squared = 10,000 - 4 = 9,996.

5. C — The difference of two squares is the product of the sum and the difference: (a + b)(a - b).

6. C — x squared + 5 x + 2 x + 10 = x squared + 7 x + 10.

7. C — Multiplication distributes over addition: a(b + c) = ab + ac.

8. B — 99 squared = 10,000 - 200 + 1 = 9,801.

9. A — (a - b)(a - b) = a squared - ab - ba + b squared = a squared - 2 ab + b squared.

10. B — 5(2 x - 3) = 10 x - 15; the 5 multiplies both terms inside the bracket.

Section B · Model answers

11. (x + 4) squared = x squared + 8 x + 16. At x = 1: the expansion gives 1 + 8 + 16 = 25, and (1 + 4) squared = 5 squared = 25. The two agree.

Marking: 1 mark for the correct expansion; 1 mark for a correct numeric verification.

12. 53 x 47 = (50 + 3)(50 - 3) = 50 squared - 3 squared = 2,500 - 9 = 2,491.

Marking: 1 mark for writing the product as (50 + 3)(50 - 3); 1 mark for 2,491.

13. The middle term is missing: squaring a sum is not the sum of the squares. The correct expansion is (x + 3) squared = x squared + 6 x + 9, because (x + 3)(x + 3) = x squared + 3 x + 3 x + 9.

Marking: 1 mark for identifying the missing middle term 2 x x x 3 = 6 x; 1 mark for the correct expansion x squared + 6 x + 9.

14. (a + b) squared - (a - b) squared = (a squared + 2 ab + b squared) - (a squared - 2 ab + b squared) = 4 ab. For a = 5, b = 2: 7 squared - 3 squared = 49 - 9 = 40, and 4 x 5 x 2 = 40. The identity checks out.

Marking: 1 mark for expanding both squares; 1 mark for simplifying to 4 ab; 1 mark for the numeric verification (40 = 40).

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15. Splitting the sides as x and 3, and x and 2, the four pieces have areas x squared, 2 x, 3 x and 6. The total area is x squared + 3 x + 2 x + 6 = x squared + 5 x + 6, which equals (x + 3)(x + 2).

Marking: 1 mark for the four pieces with correct areas; 1 mark for adding them; 1 mark for x squared + 5 x + 6.

Topic references

NCERT Class 8 Mathematics, Ganita Prakash, Chapter 6: We Distribute, Yet Things Multiply.

https://ncert.nic.in/textbook/pdf/hegp106.pdf

Concept reference only. Questions and model answers are original Evater practice material, not an official NCERT paper.

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