We Distribute, Yet Things Multiply

Standard difficulty · 20 questions · 40 marks · Time: 28 minutes

Name: _____ Date: _____ Score: ____ / 40

Show your working for Sections B and C. Answers are on the last page — try every question first!

Section A — Choose the correct answer — 8 × 1 = 8 marks

1. Using $(a + b)^2$, 62^2 equals:
(a) 3845 **(b)** 3604 **(c)** 3724 **(d)** 3844

2. Using $(a - b)^2$, 86^2 equals:
(a) 7756 **(b)** 7404 **(c)** 7396 **(d)** 8084

3. $(a + b)^2$ equals:
(a) $a^2 + ab + b^2$ **(b)** $2a + 2b$ **(c)** $a^2 + b^2$ **(d)** $a^2 + 2ab + b^2$

4. $87^2 - 11^2$ equals:
(a) 7448 **(b)** 5776 **(c)** 152 **(d)** 7449

5. $(x - 4)(x - 5)$ equals:
(a) $x^2 - 9x - 9$ **(b)** $x^2 - 9x + 20$ **(c)** $x^2 + 20x - 9$ **(d)** $x^2 + 20$

6. 72×68 equals:
(a) 4896 **(b)** 4898 **(c)** 4900 **(d)** 4904

7. Using $(a + b)^2$, 21^2 equals:
(a) 441 **(b)** 442 **(c)** 421 **(d)** 401

8. $(2x + 6)^2$ equals:
(a) $4x^2 + 24x + 36$ **(b)** $4x^2 + 12x + 36$ **(c)** $4x^2 + 36$ **(d)** $2x^2 + 24x + 36$

Section B — Short answer — 8 × 2 = 16 marks

9. Expand $(x + 3)(x - 8)$.

10. Expand $(6y - 9)^2$.

11. Find 107×93 using an identity.

12. If $a + b = 34$ and $ab = 288$, find $a^2 + b^2$.

13. Expand $(5m - 6n)^2$.

14. A rectangle is (x + 6) cm by (x + 8) cm. Write its area as an expression, then find it when x = 12.

15. Simplify $(x + 9)^2 - (x - 9)^2$, and check your answer for x = 18.

16. Multiply 6x(2x + 10).

Section C — Word problems — 4 × 4 = 16 marks

17. A square garden of side 24 m has a path 2 m wide all round its outside. Find the area of the path.

18. Rahul buys 101 books at Rs 99 each. Use an identity to find the total quickly.

19. A square tile of side 53 cm has a square hole of side 47 cm cut out. What area is left?

20. A rectangle 13 m by 11 m has both its length and breadth increased by 4 m. By how much does its area increase?

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Answer key

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Q	Answer	Working
1	**(d) 3844**	$60^2 + 2 \times 60 \times 2 + 2^2 = 3600 + 240 + 4$
2	**(c) 7396**	$90^2 - 2 \times 90 \times 4 + 4^2 = 8100 - 720 + 16$
3	**(d) $a^2 + 2ab + b^2$**	—
4	**(a) 7448**	$(87 + 11)(87 - 11) = 98 \times 76$
5	**(b) $x^2 - 9x + 20$**	$x^2 + (-4 + (-5))x + (-4 \times (-5))$
6	**(a) 4896**	$70^2 - 2^2 = 4900 - 4$
7	**(a) 441**	$400 + 40 + 1$
8	**(a) $4x^2 + 24x + 36$**	$(2x)^2 + 2 \times 2x \times 6 + 6^2$
9	**$x^2 - 5x - 24$**	$x^2 - 8x + 3x - 24$
10	**$36y^2 - 108y + 81$**	$(6y)^2 - 2 \times 6y \times 9 + 9^2$
11	**9951**	$(a + b)(a - b) = a^2 - b^2$: $10000 - 49$
12	**580**	$(a + b)^2 - 2ab = 1156 - 576$
13	**$25m^2 - 60mn + 36n^2$**	$(5m)^2 - 2 \times 5m \times 6n + (6n)^2$
14	**$x^2 + 14x + 48$; 360 cm^2**	$18 \times 20 = 360$
15	**36x; 648**	$729 - 81 = 648$
16	**$12x^2 + 60x$**	$6x \times 2x + 6x \times 10$
17	**208 m^2**	$28^2 - 24^2 = (28 + 24)(4) = 208$
18	**Rs 9,999**	$101 \times 99 = 100^2 - 1^2 = 9999$
19	**600 cm^2**	$53^2 - 47^2 = (53 + 47)(53 - 47) = 100 \times 6$
20	**112 m^2**	$(13 + 4)(11 + 4) - 13 \times 11 = 4(13 + 11) + 4^2$

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