

Name:.....

Total Marks:.....

GCSE (9-1) Grade 6

Expanding Triple Brackets



Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name.
- Answer **all** questions.
- Answer the questions in the spaces provided
 - there may be more space than you need.
- **Show all your working out**

Information

- The total mark for this paper is 60.
- The marks for **each** question are shown in brackets.
 - use this as a guide as to how much time to spend on each question.
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed

Advice

- Read each question carefully before you start to answer it
- Attempt every question
- Check your answers if you have time at the end



1. Expand and Simplify $(x + 1)(x + 3)(x + 4)$

.....
(Total 3 marks)

2. Expand and Simplify $(2x + 5)(3x + 7)(x + 5)$

.....
(Total 3 marks)



3. Expand and Simplify $(x - 3)(x - 1)(2x - 3)$

.....
(Total 4 marks)

4. Expand and Simplify $(2x + 3)(x - 2)(3x - 1)$

.....
(Total 4 marks)



5. Expand and Simplify $(x + 4)^2(3x - 7)$

.....
(Total 4 marks)

6. Expand and Simplify $(5x + 3)(2x - 1)^2$

.....
(Total 4 marks)



7. Show that $(2x + 3)^3 = 8x^3 + 36x^2 + 54x + 27$ for all values of x .

.....
(Total 4 marks)

8. Show that $(x - 4)^2(x + 3)$ simplifies to $x^3 + ax^2 + bx + c$ where a , b and c are integers.

.....
(Total 4 marks)



9. Express $(3x - 1)^3$ in the form $ax^3 + bx^2 + cx + d$ where a, b, c, d are integers.

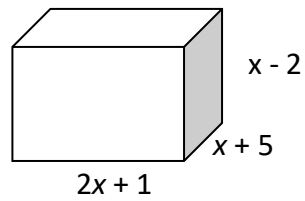
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(Total 4 marks)

10. $(3x + 5)(x - 4)(3x - 2) = 9x^3 + Ax^2 + Bx + 40$

Work out the value of A and the value of B .

.....
(Total 4 marks)

11. Here is a cuboid.



All measurements are in centimetres.

Show that the volume of the cuboid is $(2x^3 + 7x^2 - 17x - 10) \text{ cm}^3$

.....
(Total 4 marks)

12. A cuboid has dimensions $x + 2$ cm, $2x - 1$ cm and $2x + 3$ cm.
Show that the volume of the cuboid is $4x^3 + 12x^2 + 5x - 6 \text{ cm}^3$

.....
(Total 4 marks)



- 13.** (a) Given that $x^3 - x^2 - 17x - 15 = (x + 3)(x^2 + bx + c)$, where b and c are constants, work out the values of b and c

.....
(Total 4 marks)

- (b) Hence fully factorise $x^3 - x^2 - 17x - 15$

.....
(Total 2 marks)



14. Given that $(2x + 5y)(3x - y)(2x + y) = ax^3 + bx^2y + cx^2y + dy^3$
where a, b, c, d are constants, find the values of a, b, c and d .

.....
(Total 4 marks)

15. The smallest of three consecutive positive odd numbers is $(2x - 1)$.

Work out the product of the three numbers.

Give your answer in the form $ax^3 + bx^2 + cx + d$.

.....
(Total 4 marks)

TOTAL FOR PAPER IS 60 MARKS