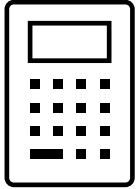


Surname:

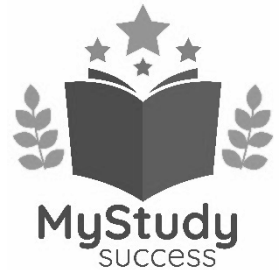
Forename(s):

GCSE Mathematics

Expand Triple Brackets



Grade 6



These questions get more difficult as your go through this paper.

This topic could come up on a calculator paper and non-calculator paper.

Materials

- **Formulae Sheet** (on the next page)
- **Black** ink or ball-point pen
- Pencil
- Eraser
- Protractor
- Compass
- Tracing Paper
- **Calculator allowed**

Instructions

- Show **all** of your working.
- Draw diagrams in pencil.
- Plot graphs in pencil.
- Diagrams are **not** accurately drawn, unless otherwise indicated.

Higher Tier Formulae Sheet

Perimeter, Area and Volume

Where a and b are the lengths of the parallel sides and h is their perpendicular separation:

Area of a trapezium = $\frac{1}{2}(a + b)h$

Volume of a prism = area of cross section $\times$ length

Where r is the radius and d is the diameter:

Circumference of a circle = $2\pi r = \pi d$

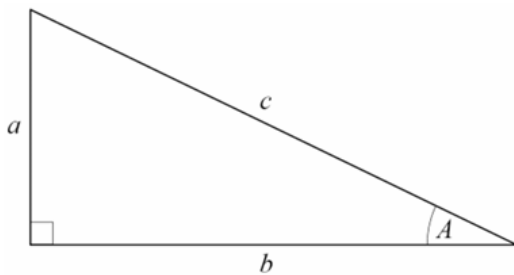
Area of a circle = πr^2

Quadratic Formula

The solution of $ax^2 + bx + c = 0$ where $a \neq 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Pythagoras' Theorem and Trigonometry

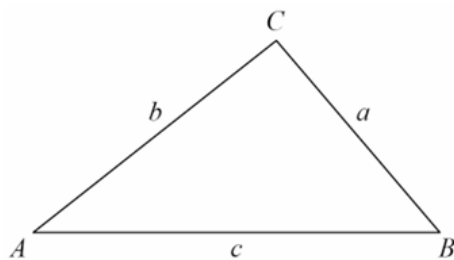


In any right-angled triangle where a , b and c are the length of the sides and c is the hypotenuse:

$$a^2 + b^2 = c^2$$

In any right-angled triangle ABC where a , b and c are the length of the sides and c is the hypotenuse:

$$\sin A = \frac{a}{c} \quad \cos A = \frac{b}{c} \quad \tan A = \frac{a}{b}$$



In any triangle ABC where a , b and c are the length of the sides:

$$\text{sine rule: } \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\text{cosine rule: } a^2 = b^2 + c^2 - 2bc \cos A$$

$$\text{Area of triangle} = \frac{1}{2}ab \sin C$$

Compound Interest

Where P is the principal amount, r is the interest rate over a given period and n is number of times that the interest is compounded:

$$\text{Total accrued} = P \left(1 + \frac{r}{100} \right)^n$$

Probability

Where $P(A)$ is the probability of outcome A and $P(B)$ is the probability of outcome B :

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

$$P(A \text{ and } B) = P(A \text{ given } B)P(B)$$

1 Expand and simplify $(x + 1)(x + 2)(x + 3)$

(Total for question 1 is 3 marks)

2 Expand and simplify $(x - 4)(x + 3)(x - 5)$

(Total for question 2 is 3 marks)

3 Expand and simplify $(2x + 3)(x - 1)(x + 2)$

(Total for question 3 is 3 marks)

4 Expand and simplify $(x - 4)(x - 6)^2$

(Total for question 4 is 3 marks)

5 Expand and simplify $(3x - 2)(x + 1)(5x - 2)$

(Total for question 5 is 3 marks)

6 Expand and simplify $(2x + 3)^3$

(Total for question 6 is 3 marks)

7 Expand and simplify $(3x + 1)^2 (11x + 5)$

(Total for question 7 is 3 marks)

8 A cube has a side length of $(5x - 4)$ cm
Find an expression for the volume of the cube.
Give your answer in its simplest form.

_____ cm^3
(Total for question 8 is 3 marks)