



SIXTH FORM SUMMER PROJECTS 2026

A Level Maths

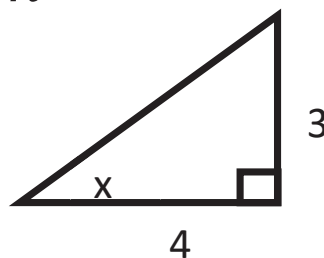
INSTRUCTIONS

Everything in this booklet is also in the higher GCSE Revision Guide.

You **must** complete the work in this booklet **before** your first A Level lesson in September. Bring your work (done on paper) with the workings set out clearly, to the first lesson where it will be collected.

Section 1.

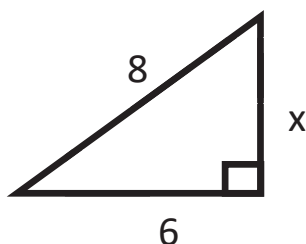
- a) Simplify $3x \times 14y$
- b) Expand and simplify $3(x + 4) + 2(x + 1)$
- c) Expand and simplify $(x + 1)(x - 1)$
- d) Factorise $3xy + 6x^2$
- e) Make x the subject of $y = 3x - 7$
- f) Find the value of $1\frac{1}{2} + \frac{3}{5}$
- g) Solve $3 - x = 5$
- h) Solve $(x + 3)(x - 2) = 0$
- i) Solve the simultaneous equations $3x + y = 5$
 $4x - y = 2$
- j) Simplify $\sqrt{2} \times \sqrt{18}$
- k) What is the gradient of the line $4y - x = 8$
- l) Simplify $\frac{1}{x} + \frac{3}{x}$
- m) Simplify $m^4 \times m^{-2}$
- n) Find the value of x



- o) Write down the quadratic formula.

Section 2.

- a) Simplify $0.5x^2 - 2x^2$
- b) Expand and simplify $5(x - 1) + 3(2x + 4)$
- c) Expand and simplify $(x + 4)^2$
- d) Factorise $4p - 8pq$
- e) Make x the subject of $y = x^2$
- f) Find the value of $\frac{3}{4} \div 7$
- g) Solve $1 - 3w = 15 + 4w$
- h) Solve $x^2 - 2x - 3 = 0$
- i) Solve the simultaneous equations $4x + 5y = 19$
 $-4x + 3y = 5$
- j) Simplify $\sqrt{20}$
- k) Write down the equation of the line with gradient 3 that goes through the point (0,5)
- l) Simplify $\frac{x}{y} \times \frac{3}{x}$
- m) Simplify $e^7 \div e^4$
- n) Find the value of x
- o) Write down the cosine rule.



Section 3.

a) Simplify $4pq - 2p \times 3q$

b) Expand and simplify $\frac{1}{2}(4x - 3) + \frac{1}{2}(6x + 3)$

c) Expand and simplify $(x - 6)(x + 6)$

d) Factorise $10 + 5y$

e) Make x the subject of $y = 4 - x$

f) Find the value of $1\frac{4}{5} \times 1\frac{1}{2}$

g) Solve $2x - 7 = 2 + x$

h) Solve $x^2 - 2x = 3$

i) Solve the simultaneous equations $6x + y = 7$
 $4x + y = 5$

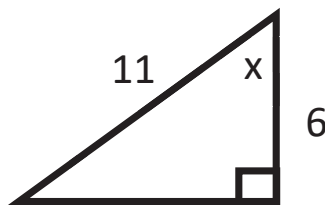
j) Rationalise $\frac{3}{\sqrt{2}}$

k) Find the y intercept of $3x = y - 7$

l) Simplify $\frac{m}{n} + \frac{n}{m}$

m) Simplify $(h^6)^2$

n) Find the value of x



o) Sketch the graph of $y = x^2$.

Section 4.

a) Simplify $3xy \times 4y$

b) Expand and simplify $7(3x - 4) + 2(4 - x)$

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

d) Factorise $x^2 + 3x + 4$

e) Make x the subject of $y = 7x + 1$

f) Find the value of $3\frac{1}{4} - \frac{2}{11}$

g) Solve $\frac{3}{x} + 1 = 2$

h) Solve $x^2 + 8x + 15 = 0$

i) Solve the simultaneous equations $8x + 3y = 8$
 $5x - 3y = 5$

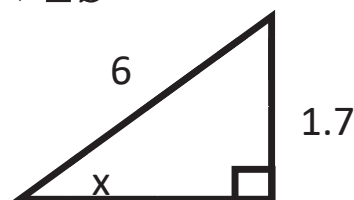
j) Expand and simplify $\sqrt{3}(1 - \sqrt{3})$

k) Write down the equation of a line parallel to
 $y = 7x - 3$

l) Simplify $\frac{3}{x} - \frac{1}{x^2}$

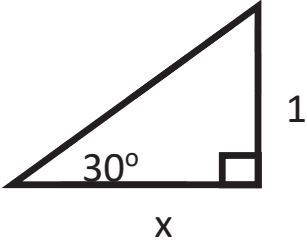
m) Simplify $3a^4b \times 2b^2$

n) Find the value of x



o) Write down the sine rule.

Section 5.

- a) Simplify $5m^2 \times 3m$
- b) Expand and simplify $3(10 - x) - 3(x + 10)$
- c) Expand and simplify $(3x - 1)(2x + 2)$
- d) Factorise $6p^2q + 9pq^4$
- e) Make x the subject of $y = \frac{x}{3} - 10$
- f) Simplify $3 \times \frac{2}{5y}$
- g) Solve $3(x - 1) = 9$
- h) Solve $x^2 + x - 12 = 0$
- i) Solve the simultaneous equations $6x + 2y = 5$
 $2x + 2y = 3$
- j) Simplify $\sqrt{5} \times \sqrt{20}$
- k) Write down the equation of a line perpendicular to $y = 7x - 3$
- l) Find the value of $7\frac{1}{2} \times \frac{3}{5}$
- m) Simplify $\frac{m^6}{m^4}$
- n) Find the value of x
- 
- o) Sketch the sine graph between 0° and 360°

Section 6.

a) Simplify $(2gh)^2$

b) Expand and simplify $5(2x + 1) - 4(x - 3)$

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

d) Factorise $x^2 - x - 6$

e) Make x the subject of $y = \frac{1}{x}$

f) Simplify $\frac{2}{x} + \frac{1}{x}$

g) Solve $8(2x + 1) = 3(5x + 3)$

h) Solve $(2x - 1)(x + 1) = 0$

i) Solve the simultaneous equations $2x + y = 8$
 $3x - 2y = 5$

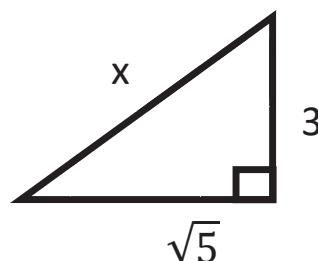
j) Simplify $\sqrt{54}$

k) Write down the equation of the line which goes through $(1, 4)$ and $(4, -2)$

l) Simplify $\frac{5}{x} + \frac{1}{y}$

m) Simplify $\frac{12a^2b^6}{3a^6b^5}$

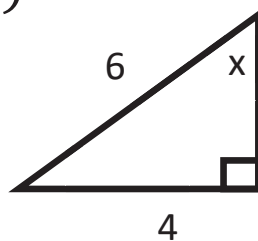
n) Find the value of x



o) Solve $4x^2 + 7x - 9 = 0$

Section 7.

- a) Simplify $14pq^2 \div 3.5pq$
- b) Expand and simplify $3x(4x - 7) - 2(6 - x)$
- c) Expand and simplify $(4x + 1)(x - 6)$
- d) Factorise fully $5m^3n + 15m^2n^3$
- e) Make x the subject of $y = \frac{1}{x} + 2$
- f) Simplify $\frac{8}{9} \div \frac{x}{y}$
- g) Solve $\frac{x+1}{3} = 2 + x$
- h) Solve $x^2 + 9x = 10$
- i) Solve the simultaneous equations $4x + y = 21$
 $3x - 3y = 12$
- j) Rationalise $\frac{7}{\sqrt{3}}$
- k) What is the gradient of the line $3x + 7y = 14$
- l) Simplify $\frac{a}{4} - \frac{b}{12}$
- m) Simplify $(5gf^2)^3$
- n) Find the value of x



- o) In a test the boys mean score was 17.5 and their range was 15. The girls had a mean score of 21.3 and their range as 26. Interpret what these statistics mean.

Section 8.

a) Simplify $5u^2 \times 3u^2$

b) Expand and simplify $11(x - 1) - 3(x - 4)$

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

d) Factorise $x^2 - 8x + 12$

e) Make x the subject of $y = \frac{5x+3}{x}$

f) Simplify $\frac{1}{x} - \frac{1}{2}$

g) Solve $4 + 2x = -8$

h) Solve $x^2 + 10x = 0$

i) Solve the simultaneous equations $2x - y = 6$
 $4x + 3y = 22$

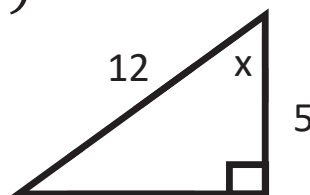
j) Simplify $(3\sqrt{5})^2$

k) What is the equation of the line which passes through $(1,4)$ and $(4, -2)$

l) Simplify $\frac{x}{6} \div \frac{2}{x}$

m) Simplify $(m^3n^2)^6$

n) Find the value of x



o) Sketch the cosine graph between 0° and 360° .

Section 9.

a) Simplify $3x + 11y - (-x)$

b) Expand and simplify $\frac{1}{4}(3x + 16) + \frac{3}{4}(4x + 1)$

c) Expand and simplify $(x - 4)(x + 4)$

d) Factorise $2x^2 + 3x + 1$

e) Make x the subject of $y = 4x^2 - 3$

f) Simplify $\frac{2}{x} \times \frac{1}{x}$

g) Solve $4(x + 1 + 3x) = 4x + 22$

h) Solve $x^2 - 9 = 0$ (find both answers)

i) Solve the simultaneous equations $y = x + 8$
 $x + y = 14$

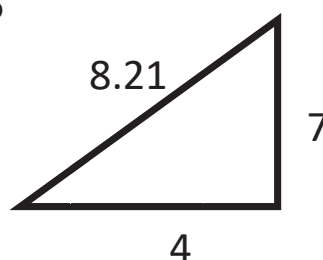
j) Simplify $\sqrt{108}$

k) What is the equation of the y axis?

l) Calculate $7 \div 1\frac{1}{2}$

m) Simplify $4m^3n \times 7mn^6$

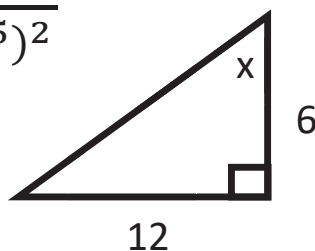
n) Is this triangle right angled?



o) Sketch the graph of $y = x^3$.

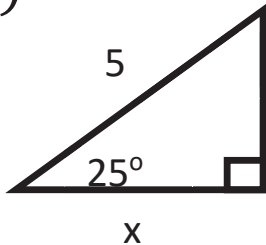
Section 10.

- a) Simplify $x^2 - (3x + 4x^2)$
- b) Expand and simplify $-3(4x + 1) + 3(1 - 4x)$
- c) Expand and simplify $(3 - x)(x - 3)$
- d) Factorise $6st^2 - 12t^3 + 24st$
- e) Make x the subject of $y = \frac{1}{x+1}$
- f) Simplify $\frac{x^2}{4} \div \frac{x}{2}$
- g) Solve $\frac{x+4}{2} = \frac{3}{4}$
- h) Solve $x^2 - 144 = 0$
- i) Solve the simultaneous equations $y = 2x + 4$
 $y = x + 7$
- j) Simplify $5(2 + \sqrt{7})^2$
- k) What is the equation of the x axis?
- l) Simplify $\frac{3a}{7} \times \frac{1}{4a}$
- m) Simplify $\frac{3m^2 \times 2mn}{(2nm^{1.5})^2}$
- n) Find the value of x



- o) A fair coin is tossed three times. What is the probability of it landed on tails three times in a row?

Section 11.

- a) Simplify $6rs \times 3t \div 4s$
- b) Expand and simplify $5(2x - 11) - 3(2x - 1)$
- c) Expand and simplify $(2x + 7)^2$
- d) Factorise $x^2 + x - 20$
- e) Make x the subject of $y = 8x^3$
- f) Evaluate $\frac{1}{7} \times 10\frac{1}{3}$
- g) Solve $\frac{1}{5}(10x + 1) = \frac{1}{2}(8x - 10)$
- h) Solve $2x^2 + 3x + 1 = 0$
- i) Solve the simultaneous equations $3x + 2y = 8$
 $5x + 3y = 13$
- j) Simplify $2\sqrt{72}$
- k) Write down the equation of the line which goes through $(1,1)$ and has a gradient of 0.5
- l) Simplify $\frac{3}{2x} - \frac{1}{3y}$
- m) Simplify $(\sqrt{3}x^4)^3$
- n) Find the value of x

- o) Write down at least three formulae which involve speed, distance and time.

Section 12.

a) Simplify $2j^2 \times 4j^{-3}k^5$

b) Expand and simplify $7(x - 8) + 4(2x - 5)$

c) Expand and simplify $(x + 6)(y - x)(x + 3)$

d) Factorise $x^2 + 7x + 6$

e) Make x the subject of $y = \frac{1}{5\sqrt{x}}$

f) Simplify $\frac{14x}{3} + \frac{2x}{5}$

g) Solve $10 - x = 3x - 6$

h) Solve $2x^2 - 10x - 12 = 0$

i) Solve the simultaneous equations $4x + 2y = 10$
 $7x + 3y = 16$

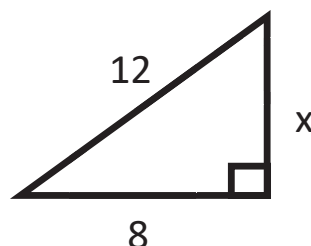
j) Rationalise $\frac{1}{\sqrt{8}}$

k) What is the gradient of $4y = x + 13$

l) Simplify $\frac{2}{x+1} \times \frac{1}{x-1}$

m) Simplify $(3.9 \times 10^{14}) \div (1.3 \times 10^{12})$

n) Find the value of x



o) Sketch the tan graph between 0° and 360° .

Section 13.

a) Simplify $\sqrt{9x^2}$

b) Expand and simplify $18(2 - x) - 16(3x + 1)$

c) Expand and simplify $(3p + 4)^2(5 - p)$

d) Factorise fully $3m^2n + 6mn^2 + m^2n^2$

e) Make x the subject of $y = \frac{x+3}{2}$

f) Evaluate $14 \div x \frac{1}{4}$

g) Solve $3x - 1.5 = 4(x + 0.5)$

h) Solve $3x^2 - 12 = 0$

i) Solve the simultaneous equations $2x + 9y = 1$

$$5x - 4y = 29$$

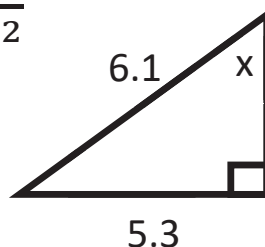
j) Simplify $(\sqrt{2} + 3)(3 - \sqrt{2})$

k) What is the equation of the line parallel to $y = 5 - 2x$ which goes through the point (0,0)

l) Simplify $\frac{2}{ef} - \frac{1}{f^2}$

m) Simplify $\frac{10e^2f^3}{2ef \times 7e^2}$

n) Find the value of x



o) Sketch the graph of $y = \frac{1}{x}$

Section 14.

a) Simplify $(\sqrt{2x})^4$

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

c) Expand and simplify $(x^2 + 1)(x - 2)$

d) Factorise as a difference of two squares $4x^2 - 36$

e) Make x the subject of $y = \frac{x+3}{-x+1}$

f) Simplify $3x \times \frac{1}{6}$

g) Solve $\frac{x}{2} + \frac{3x}{4} = 15$

h) Solve $x^2 + 9x + 20 = 0$

i) Solve the simultaneous equations $3x - 8y = 5$
 $5x - 12y = 9$

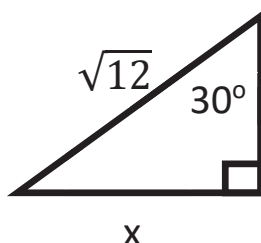
j) Rationalise $\frac{\sqrt{3}}{\sqrt{6}}$

k) Write down the equation of the line which goes through $(2,15)$ and has a gradient of 7.

l) Simplify $\frac{1}{x} \div 4.5$

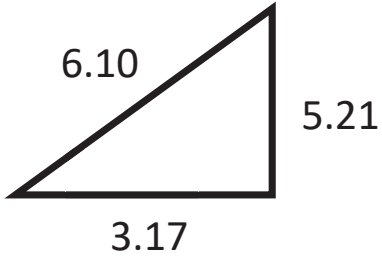
m) Simplify $\sqrt{8}a^2b^5 \times \sqrt{2}a^3b$

n) Find the value of x



o) Expand and simplify $(x + 3)^3$

Section 15.

- a) Simplify $21t - t^2 + 3t - (-2t)^3 + t$
- b) Expand and simplify $4x^2(3 - x) + x^2(2 + x)$
- c) Expand and simplify $(3x - 4y)(x + 2)$
- d) Factorise as a difference of two squares $x^2 - 144$
- e) Make x the subject of $y = x^2 + 3x$
- f) Simplify $\frac{1}{2x} + \frac{3}{8x^2}$
- g) Solve $3(x - 1) = 5(x + 1)$
- h) Solve $3x^2 - x - 2 = 0$
- i) Solve the simultaneous equations $x + 2 = 6y$
 $8y - 1 = 3x$
- j) Rationalise $\frac{4}{\sqrt{5}}$
- k) What is the gradient of $3x - 4y = 1$
- l) Simplify $\frac{x}{3} \times \frac{2}{x-2}$
- m) Simplify $\frac{1}{2m^4n^3}$
- n) Is this triangle right angled?
- 
- o) What is the value of $3 + 1 \times 4^2$



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