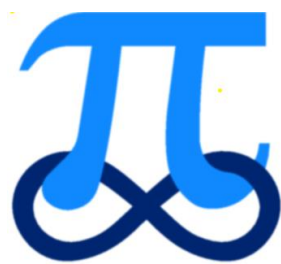


# Edexcel

# GCSE Maths (1 – 9)

# Revision Pack

## Algebra



Edited by: K V Kumaran

[kvkumaran@gmail.com](mailto:kvkumaran@gmail.com)

07961319548

**Q1.**

Kalinda buys  $x$  packs of currant buns and  $y$  boxes of iced buns.

There are 6 currant buns in a pack of currant buns.

There are 8 iced buns in a box of iced buns.

Kalinda buys a total of  $T$  buns.

Write down a formula for  $T$  in terms of  $x$  and  $y$ .

.....

**Q2.**

Write  $\frac{3}{b} + \frac{2}{a-b}$  as a single fraction in its simplest form.

.....

**Q3.**

Here is a rectangle.



Diagram **NOT**  
accurately drawn

The rectangle has a width of  $(2x - 3) \text{ cm}$ .  
It has an area of  $(10x^2 - x - 21) \text{ cm}^2$ .

Work out the length of the rectangle when  $x = 4$

..... cm

**Q4.**

Solve the simultaneous equations

$$\begin{aligned} 5x + 2y &= 11 \\ 4x - 3y &= 18 \end{aligned}$$

$x = \dots\dots\dots$

$y = \dots\dots\dots$

**Q5.**

Solve algebraically the simultaneous equations

$$\begin{aligned}x^2 + y^2 &= 25 \\ y - 3x &= 13\end{aligned}$$

.....

**Q6.**

Solve

$$\begin{aligned}2x + 3y &= \frac{2}{3} \\ 3x - 4y &= 18\end{aligned}$$

$x =$  .....

$y =$  .....

**Q7.**

Solve the simultaneous equations

$$3x + 4y = 5$$

$$2x - 3y = 9$$

$$x = \dots\dots\dots$$

$$y = \dots\dots\dots$$

**Q8.**

Solve the simultaneous equations

$$4x + 7y = 1$$

$$3x + 10y = 15$$

$$x = \dots\dots\dots$$

$$y = \dots\dots\dots$$

**Q9.**

Solve the inequality  $x^2 > 3(x + 6)$

.....

**Q10.**

Solve  $x^2 > 3x + 4$

.....

**Q11.**

Solve  $x^2 - 6x - 8 = 0$

Write your answer in the form  $a \pm \sqrt{b}$  where  $a$  and  $b$  are integers.

.....

**Q12.**

Solve  $\frac{x+2}{3x} + \frac{x-2}{2x} = 3$

$x = \dots\dots\dots$

**Q13.**

Solve  $\frac{4x-1}{5} + \frac{x+4}{2} = 3$

$x = \dots\dots\dots$

**Q14.**

(a) Solve  $\frac{4(8x - 2)}{3x} = 10$

.....  
(3)

(b) Write as a single fraction in its simplest form

$$\frac{2}{y+3} - \frac{1}{y-6}$$

.....  
(3)

**Q15.**

Solve  $x^2 = 4(x - 3)^2$

.....



**Q16.**

Write as a single fraction in its simplest form

$$\frac{2x}{x-1} - \frac{7x-3}{x^2-1}$$

.....

**Q17.**

Simplify fully  $\frac{2x^2+5x-3}{x^2-9}$

.....

**Q18.**

Simplify fully  $\frac{7x^2-21x}{x^2+2x-15}$

.....

**Q19.**

Show that  $\frac{2x^2 - 3x - 5}{x^2 + 6x + 5}$  can be written in the form  $\frac{ax + b}{cx + d}$  where  $a, b, c$  and  $d$  are integers.

**Q20.**

Simplify fully  $\frac{x^2 - 2x - 15}{2x^2 + 7x + 3}$

**Q21.**

Simplify fully  $\frac{x^2 - 2x - 15}{x^2 - 4x - 21}$

**Q22.**

Simplify completely  $\frac{2x^2 - 9x - 5}{4x^3 + 2x^2}$

.....

**Q23.**

Simplify fully  $\frac{2x^2 + 6x}{x^2 - 2x - 15}$

.....

**Q24.**

Simplify fully  $\frac{3x^2 - 6x}{x^2 + 2x - 8}$

.....

**Q25.**

Show that  $\frac{3x+6}{x^2-3x-10} \div \frac{x+5}{x^3-25x}$  simplifies to  $ax$  where  $a$  is an integer.

**Q26.**

$$\frac{2y-12}{y^2-8y+12}$$

(a) Simplify

.....

(3)

$$\frac{3}{x-4} - \frac{1}{x+5}$$

(b) Write as a single fraction

.....

(2)

**Q27.**

Simplify fully  $\frac{4}{2-x} - \frac{3}{x}$

.....

**Q28.**

(a) Simplify  $\frac{4(x+5)}{x^2+2x-15}$

.....

**Q29.**

Simplify fully  $(x+5)^2 - (x-5)^2$

.....

Q30.

(a) Simplify fully  $\frac{x^2 + 3x - 4}{2x^2 - 5x + 3}$

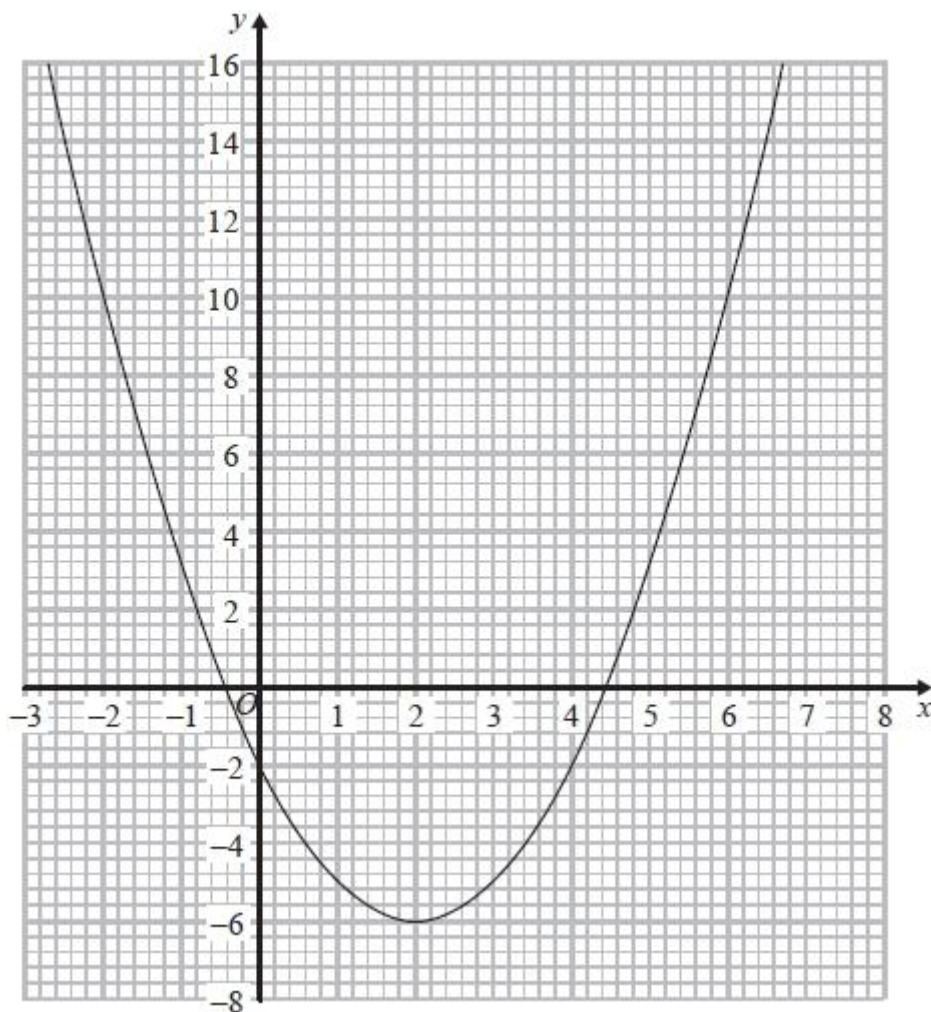
.....  
(3)

(b) Write  $\frac{4}{x+2} + \frac{3}{x-2}$  as a single fraction in its simplest form.

.....  
(3)

**Q31.**

The diagram shows the graph of  $y = x^2 - 4x - 2$



(a) Use the graph to find estimates for the solutions of

(i)  $x^2 - 4x - 2 = 0$

.....

(ii)  $x^2 - 4x - 6 = 0$

.....

(3)

(b) Use the graph to find estimates for the values of  $x$  that satisfy the simultaneous equations

$$\begin{aligned} y &= x^2 - 4x - 2 \\ x + y &= 6 \end{aligned}$$

.....

(3)

**Q32.**

(a) (i) Factorise  $x^2 - 12x + 27$

.....

(ii) Solve the equation  $x^2 - 12x + 27 = 0$

.....

(3)

(b) Factorise  $y^2 - 100$

.....

(1)

**Q33.**

(a) Factorise  $e^2 - 100$

.....

(1)

(b) Factorise  $2x^2 - 7x - 15$

.....

(2)

(c) Simplify  $\frac{(g-7)^9}{(g-7)^3}$

.....



**Q34.**(a) Factorise  $x^2 + 5x + 4$ 

.....

(2)

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

.....

(2)

(c) Write as a single fraction  $\frac{1}{2x} + \frac{1}{5x} - \frac{1}{3x}$ 

.....

(2)

**Q35.**Make  $a$  the subject of the formula  $p = \frac{3a + 5}{4 - a}$

**Q36.**

Make  $a$  the subject of  $a + 3 = \frac{2a + 7}{r}$

.....

**Q37.**

Solve the equations

$$x^2 + y^2 = 36$$

$$x = 2y + 6$$

.....

**Q38.**

**C** is the curve with equation  $y = x^2 - 4x + 4$

**L** is the straight line with equation  $y = 2x - 4$

**L** intersects **C** at two points, *A* and *B*.

Calculate the exact length of *AB*.

**Q39.**

(a) Expand and simplify  $x(x + 1)(x - 1)$

(2)

In a list of three consecutive positive integers at least one of the numbers is even and one of the numbers is a multiple of 3

*n* is a positive integer greater than 1

(b) Prove that  $n^3 - n$  is a multiple of 6 for all possible values of *n*.

(2)

$2^{61} - 1$  is a prime number.

(c) Explain why  $2^{61} + 1$  is a multiple of 3

(2)

**Q40.**

Show that

$$(3x - 1)(x + 5)(4x - 3) = 12x^3 + 47x^2 - 62x + 15$$

for all values of  $x$ .

**Q41.**

(a) Expand and simplify  $(y + 2)(y + 5)$

.....  
(2)

(b) Factorise  $e^2 + e - 12$

.....  
(2)

(c) Solve  $3x^2 - x - 1 = 0$

Give your solutions correct to 2 decimal places.

.....  
(3)

**Q42.**

(a) Factorise  $x^2 + 7x$

.....

(1)

(b) Factorise  $y^2 - 10y + 16$

.....

(2)

\*(c) (i) Factorise  $2t^2 + 5t + 2$

.....

(ii)  $t$  is a positive whole number.

The expression  $2t^2 + 5t + 2$  can never have a value that is a prime number.

Explain why.

.....

.....

.....

(3)

**Q43.**

(a) Factorise  $6 + 9x$

.....

(1)

(b) Factorise  $y^2 - 16$

.....

(1)

(c) Factorise  $2p^2 - p - 10$

.....

(2)

**Q44.**

(a) Factorise  $y^2 + 7y + 6$

.....  
(2)

(b) Solve  $6x + 4 > x + 17$

.....  
(2)

(c)  $n$  is an integer with  $-5 < 2n \leq 6$

Write down all the values of  $n$

.....  
(2)

**Q45.**

The function  $f$  is such that

$$f(x) = 4x - 1$$

(a) Find  $f^{-1}(x)$

$f^{-1}(x) =$  .....  
(2)

The function  $g$  is such that

$$g(x) = kx^2 \text{ where } k \text{ is a constant.}$$

Given that  $fg(2) = 12$

(b) work out the value of  $k$

$k =$  .....  
(2)

**Q46.**

Here are the first 5 terms of a quadratic sequence.

1      3      7      13      21

Find an expression, in terms of  $n$ , for the  $n$ th term of this quadratic sequence.

.....

**Q47.**

Here are the first five terms of a sequence.

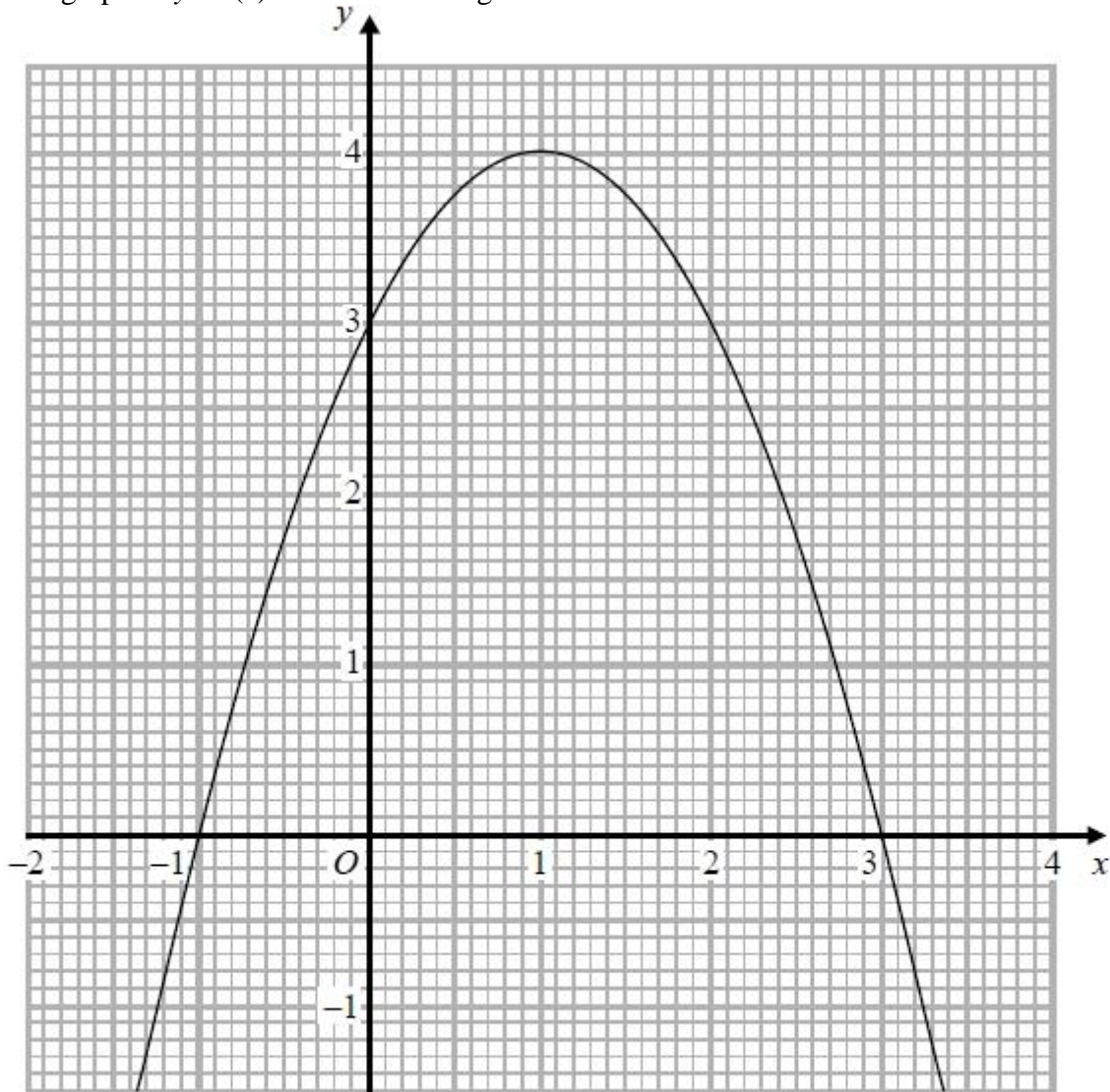
4      11      22      37      56

Find an expression, in terms of  $n$ , for the  $n$ th term of this sequence.

.....

**Q48.**

The graph of  $y = f(x)$  is drawn on the grid.



(a) Write down the coordinates of the turning point of the graph.

(....., .....) )

(1)

(b) Write down the roots of  $f(x) = 2$

.....

(1)

(c) Write down the value of  $f(0.5)$

.....

(1)



**Q49.**

Solve  $2x^2 + 4x - 5 = 0$

Give your solutions correct to 2 decimal places.

.....

**Q50.**

Solve  $6x^2 - x - 15 = 0$

.....

**Q51.**

Solve  $3x^2 + 6x - 2 = 0$

Give your solutions correct to 2 decimal places.

.....

**Q52.**

Solve  $\frac{3x - 2}{4} - \frac{2x + 5}{3} = \frac{1 - x}{6}$

$x = \dots\dots\dots$

**Q53.**

Solve  $\frac{4 - 2x}{x + 1} = x$

$\dots\dots\dots$