

Programme 2 Quadratic Functions

Worksheet 1: Programme Questions

1. What equation does Jamie use to draw the graph of distance against time for the speed skydiving?

2. In theory, what time could the divers complete the racing kilometre in?

3. What is the name for the type of curve produced by any quadratic function?

4. What power of x gives a quadratic function?

5. Is $y = x^3 + 3x^2 - 4x$ a quadratic function?

6. Describe the graph of the function $y = 5 - x^2$

7. What is the Kangaroo Kid's real name?

8. When Jamie plots the graph for the quad jump what scale does he use on the x axis?

9. What maximum height above the ramp should the Kid reach, according to the graph of the quadratic?

10. In the Tick or Trash item, which values of x were calculated wrongly when completing the table of values for $y = 2x + x^2$?

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Worksheet 2: Tick or Trash

Here are some questions and answers (by Students A and B) on quadratic functions. Decide which answers to Tick (correct) and which to Trash (incorrect). Give reasons.

Question 1

(a) Complete the table of values for $y = 2x^2$

x	-3	-2	-1	0	1	2	3
y							

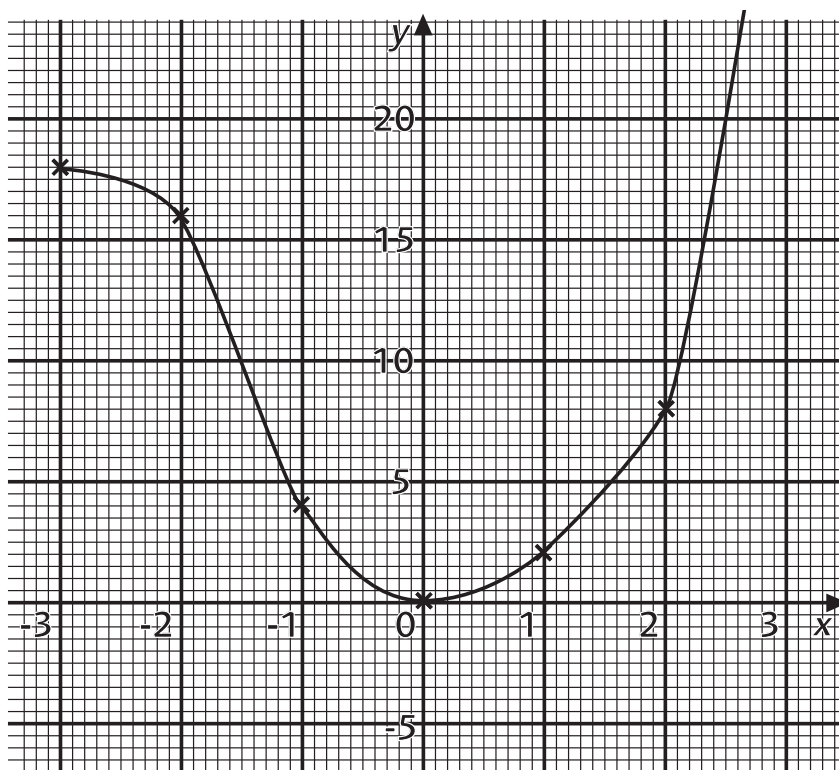
(b) On the grid, draw the graph of $y = 2x^2$

Student A Answer

(a)

x	-3	-2	-1	0	1	2	3
y	18	16	4	0	2	8	36

(b)



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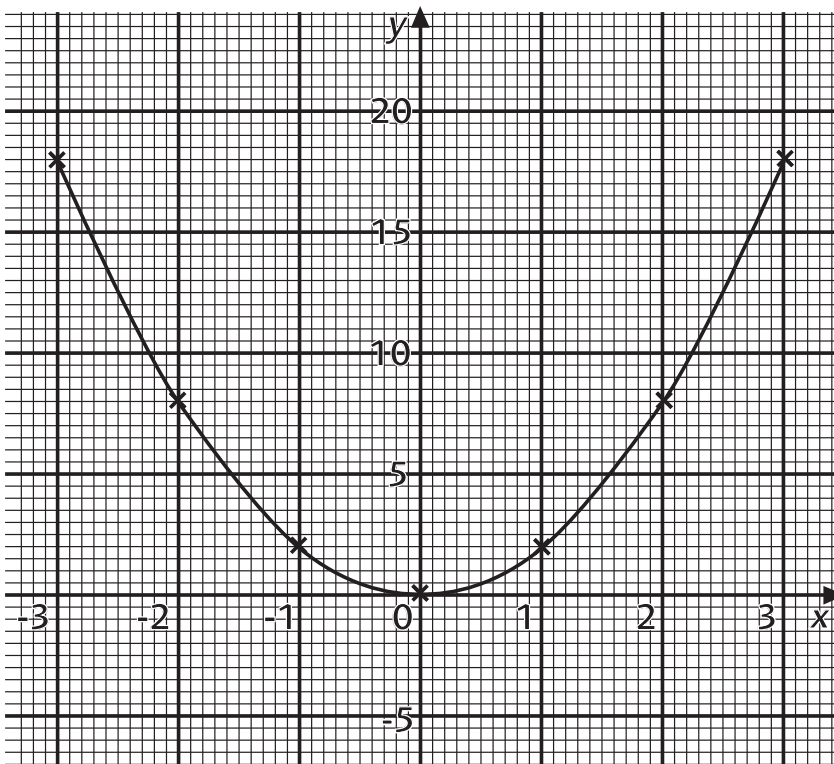
Worksheet 2: Tick or Trash

Student B Answer

(a)

x	-3	-2	-1	0	1	2	3
y	18	8	2	0	2	8	18

(b)



Question 2

(a) Complete the table of values for $y = 5 - x^2$

x	-3	-2	-1	0	1	2	3
y							

(b) On the grid, draw the graph of $y = 5 - x^2$

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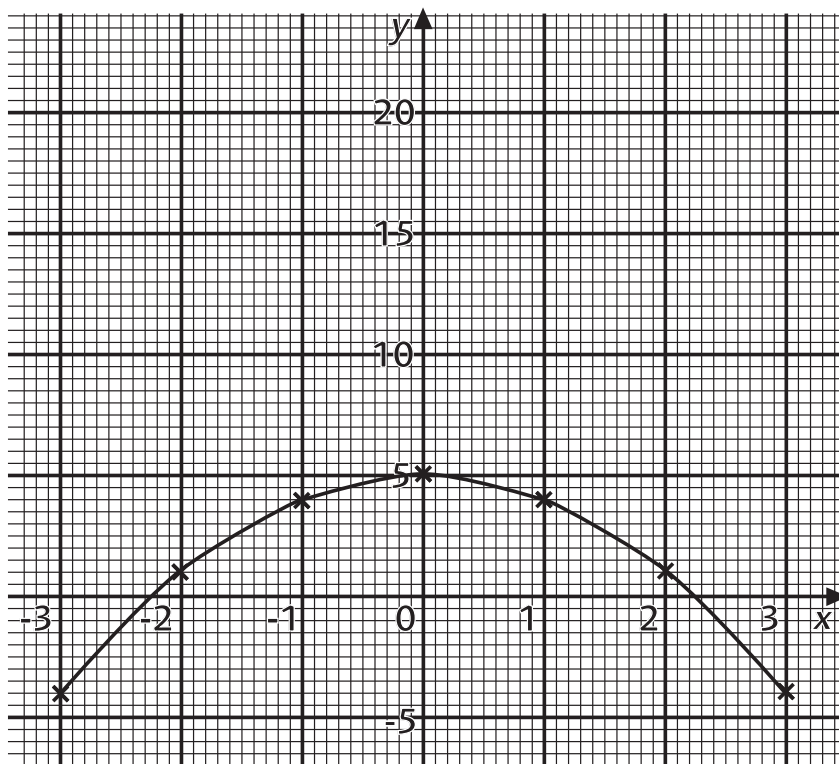
Worksheet 2: Tick or Trash

Student A Answer

(a)

x	-3	-2	-1	0	1	2	3
y	-4	1	4	5	4	1	-4

(b)



Student B Answer

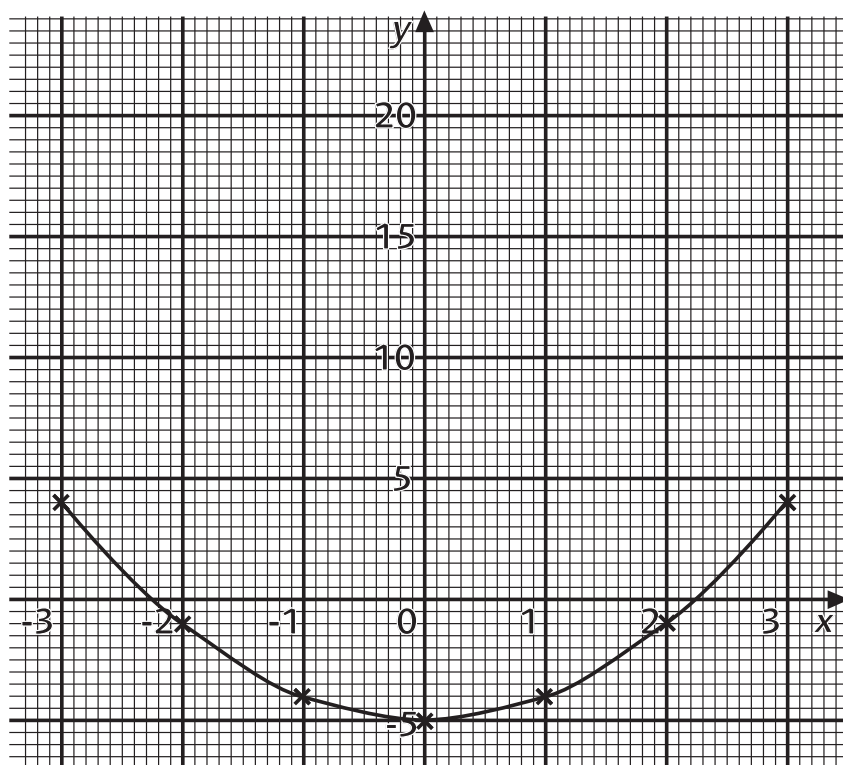
(a)

x	-3	-2	-1	0	1	2	3
y	4	-1	-4	-5	-4	-1	4

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Worksheet 2: Tick or Trash

(b)



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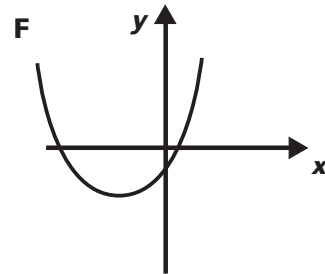
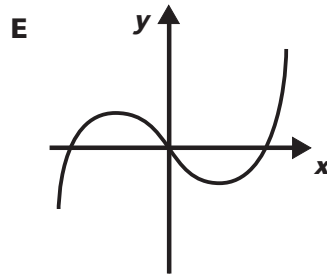
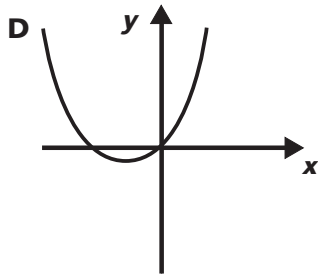
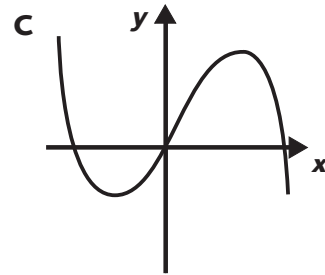
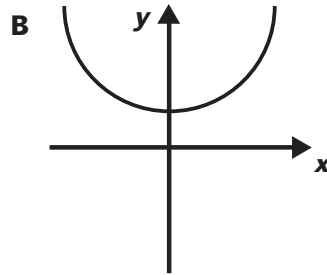
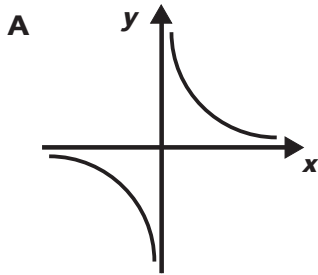
Worksheet 3a: Exam Practice Questions (Edexcel)

Question 1

National curriculum reference: A2d

Date: November 1998

Paper: 4



Each of the equations in the table represents one of the graphs A to F.
Write the letter of each graph in the correct place in the table.

Equation	Graph
$y = x^2 + 3x$	
$y = x - x^3$	
$y = x^3 - 2x$	
$y = x^2 + 2x - 4$	
$y = \frac{4}{x}$	
$y = x^2 + 3$	

[3]

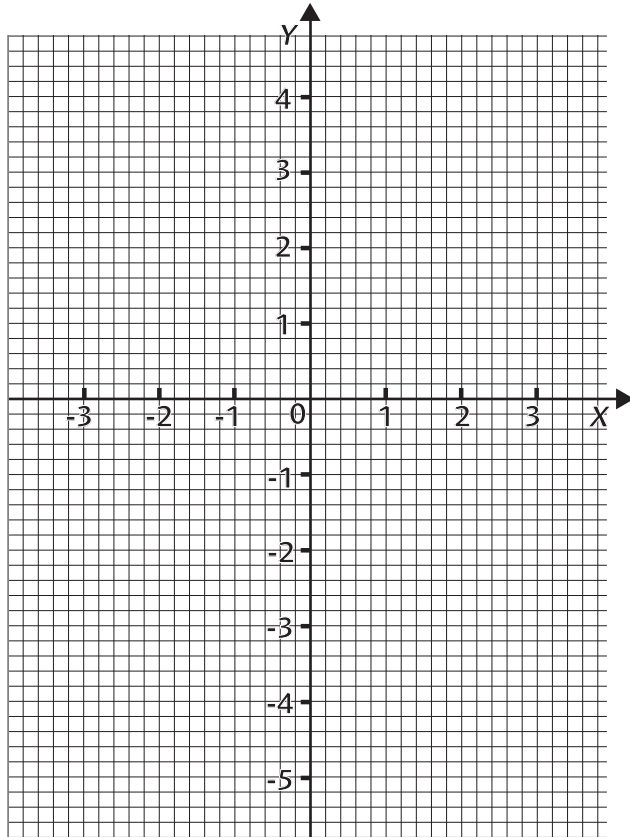
Programme 2 Quadratic Functions

Worksheet 3a: Exam Practice Questions (Edexcel)

Question 2

National curriculum reference: A2d Date: June 1998 Paper: 3

- (a) On the grid, draw the graph of $y = x^2 - x - 4$
Use values of x between -2 and $+3$ (4 marks)



- (b) Use your graph to write down an estimate for
- i) the minimum value of y
 - ii) the solutions of the equation $x^2 - x - 4 = 0$
($x = \dots\dots\dots$ or $\dots\dots\dots$)
- (3 marks)
[7]

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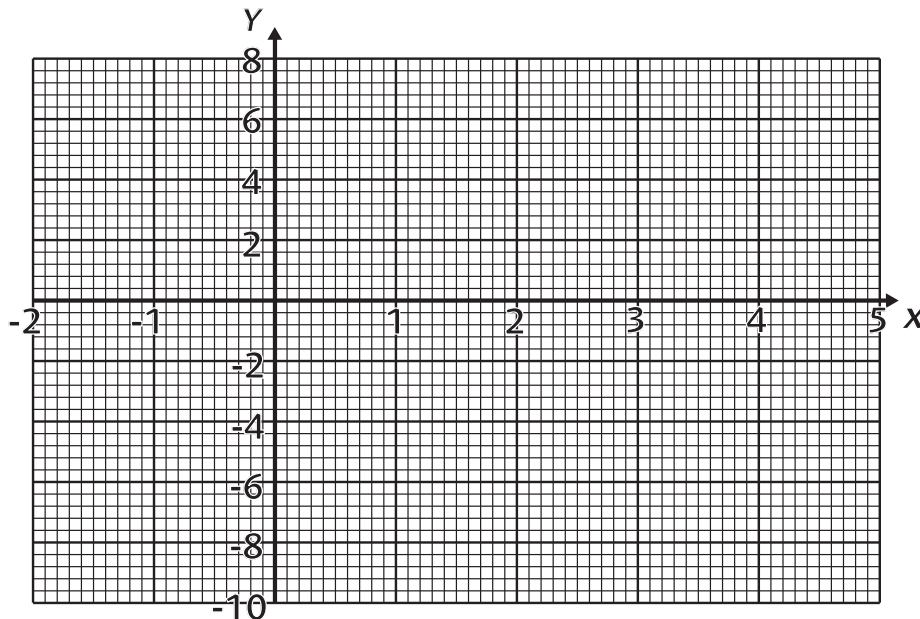
Worksheet 3a: Exam Practice Questions (Edexcel)

Question 3

National curriculum reference: A2d Date: June 1995 Paper: 1

- (a) On the grid below, draw the graph of $y = x^2 - 3x - 5$ for values of x between -2 and $+5$.

x	-2	-1	0	1	2	3	4	5
y								



- (b) Use your graph to solve the equation $x^2 - 3x - 5 = 0$

[6]

Total = 16

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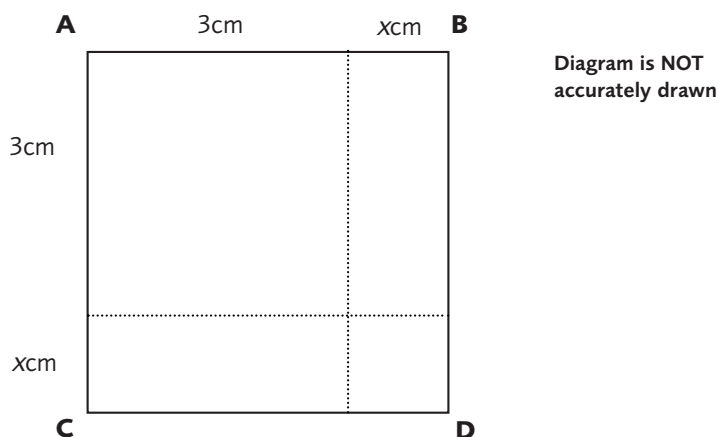
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Worksheet 3b: Exam Practice Questions (Edexcel)

Question 1

National curriculum reference: A3b Date: June 1997 Paper: 3

In the diagram, each side of the square ABCD is $(3 + x)$ cm.



(a) Write down an expression in terms of x for the area, in cm^2 , of the square ABCD.

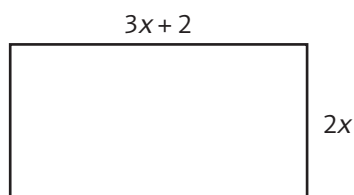
The actual area of the square ABCD is 10cm^2 .

(b) Show that $x^2 + 6x = 1$

[4]

Question 2

National curriculum reference: A3c Date: June 1999 Paper: 6



The diagram shows a rectangle with length $3x + 2$ and width $2x$.

All measurements are given in centimetres.

The perimeter of the rectangle is P centimetres.

The area of the rectangle is A square centimetres.

(a) Write down an expression in its simplest form, in terms of x , for

i) P

ii) A

(3 marks)

$P = 44$

(b) Work out the value of A .

(3 marks)

[6]

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Worksheet 3b: Exam Practice Questions (Edexcel)

Question 3

National curriculum reference: A3d Date: June 1998 Paper: 4

(a) Solve $7 - \frac{3x}{2} = 11$ (2 marks)

(b) i) Factorise $x^2 + 4x - 12$

Hence, or otherwise,

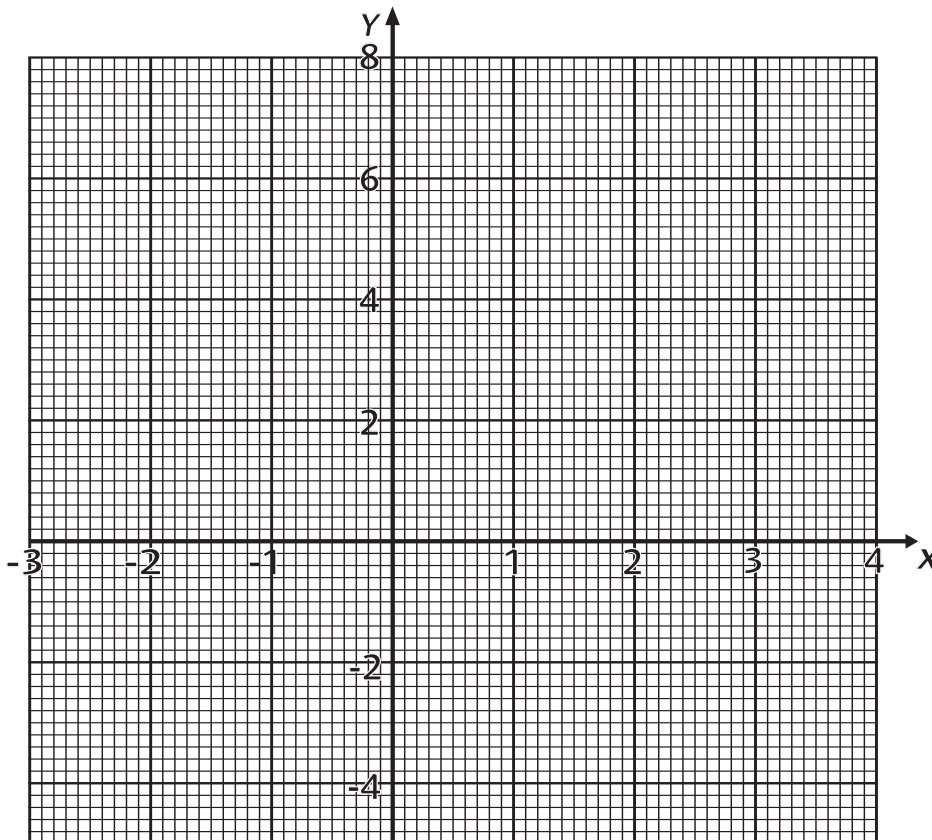
ii) Solve $x^2 + 4x - 12 = 0$ (4 marks)

[6]

Question 4

National curriculum reference: FM4a Date: November 1997 Paper: 6

(a) On the grid below, draw the graph of $y = 5 + 2x - x^2$ for $-2 < x < 4$.



(b) By drawing a suitable straight line on your graph, find the approximate solutions to

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

[6]

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Worksheet 3b: Exam Practice Questions (Edexcel)

Question 5

National curriculum reference: FM4a Date: June 1997 Paper: 5

(a) Complete the table of values for the graphs of

$$y = x^3 - 2 \text{ and}$$

$$y = 3x^2 + 3x - 6.$$

x	-2	-1	0	1	2	3	4
$y = x^3 - 2$		-3	-2	-1		25	62
$y = 3x^2 + 3x - 6$	0		-6	0	12	30	

(b) i) Use the graph paper on the following page to draw the graphs of

$$y = x^3 - 2 \text{ and } y = 3x^2 + 3x - 6.$$

ii) Use your graph to solve the equation $x^3 - 3x^2 - 3x + 4 = 0$.

[3]

Question 6

National curriculum reference: FM4a Date: June 1995 Paper: 1

Solve the equation

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

[4]

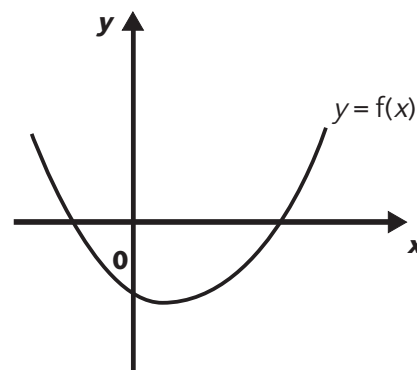
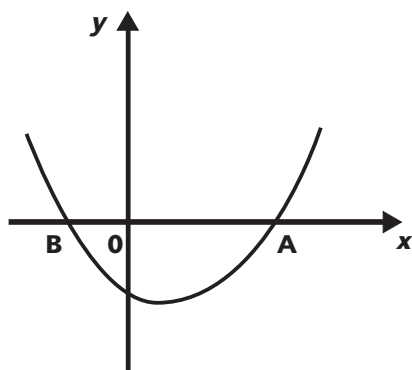
Question 7

National curriculum reference: FM4a Date: June 1997 Paper: 4

(a) i) Factorise $x^2 - 4x - 12$.

ii) Solve $x^2 - 4x - 12 = 0$.

(b) Write down the coordinates of A and B.



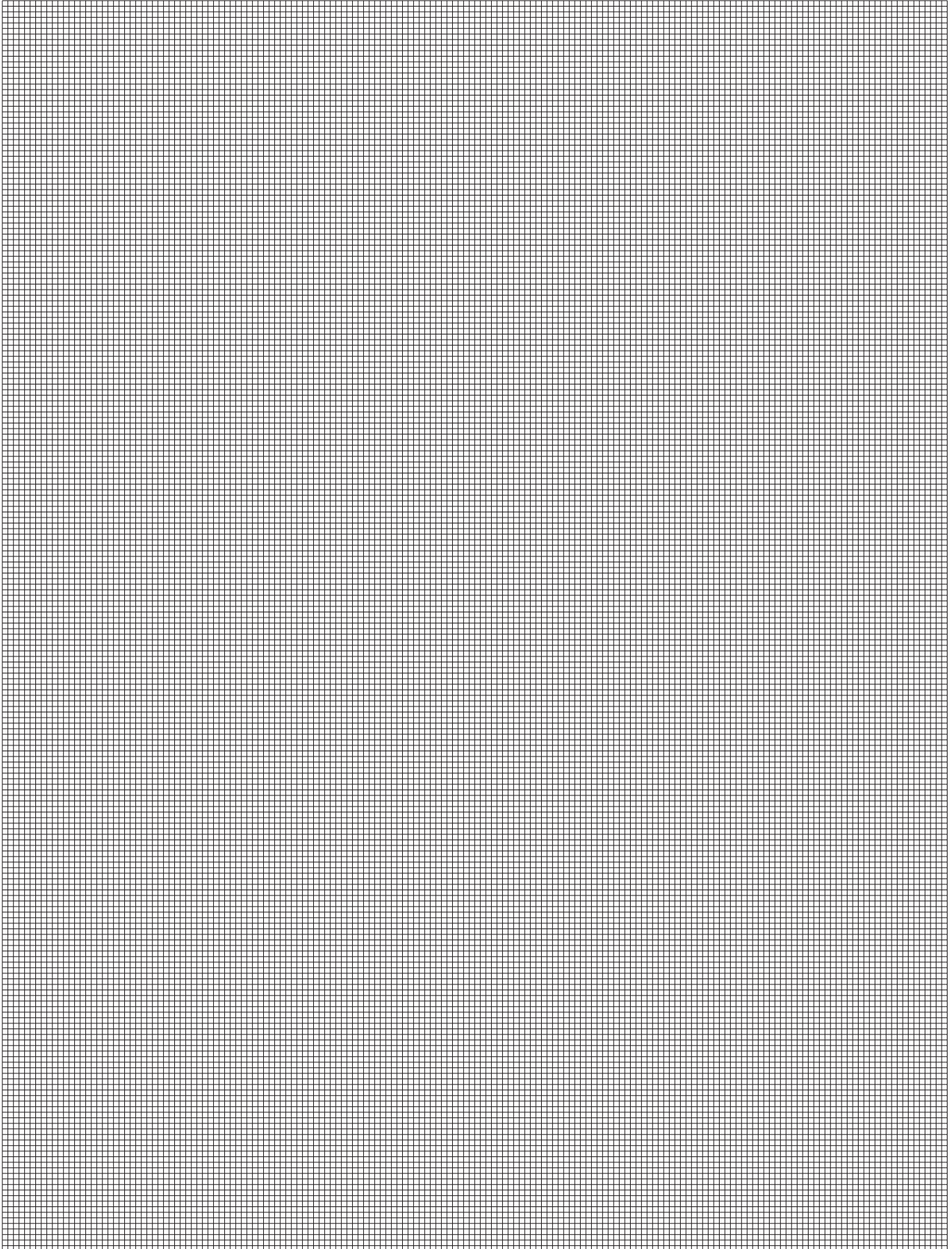
$$f(x) = x^2 - 4x - 12.$$

The diagram shows a sketch of the graph of $y = x^2 - 4x - 12$.

The curve cuts the x -axis at the points A and B.

(c) Sketch on the axes above the graph of

$$y = f(x - 2).$$



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Worksheet 3b: Exam Practice Questions (Edexcel)

Question 8

National curriculum reference: A3d Date: June 1999 Paper: 6

(a) Expand and simplify

$$(2x - 5)(x + 3)$$

(2 marks)

(b) i) Factorise

$$x^2 + 6x - 7$$

ii) Solve the equation

$$x^2 + 6x - 7 = 0$$

(3 marks)

[5]

Total = 34