

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Pearson
Edexcel Award

Centre Number

Candidate Number

Thursday 10 January 2019

Morning (Time: 1 hour 30 minutes)

Paper Reference **AAL20/01**

Algebra

Level 2

(Calculator NOT allowed)

You must have: Ruler graduated in centimetres and millimetres,
pen, HB pencil, eraser.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*
- **Calculators are not allowed.**



Information

- The total mark for this paper is 80
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

You must NOT use a calculator.

- 1 Place a tick in the appropriate column of the table to show whether each of the following is an equation, an expression or a formula.

	Equation	Expression	Formula
$6x + 4 = 12$			
speed = distance \div time			
$9x - 5$			
$x^2 = x - 4$			

(Total for Question 1 is 3 marks)

- 2 (a) Solve the inequality $x - 12 < 2$

.....
(1)

- (b) Solve the inequality $2y + 7 \geq 3$

.....
(2)

(Total for Question 2 is 3 marks)

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3 (a) Solve $5e + 2 = 17$

$e = \dots\dots\dots$
(2)

(b) Solve $4n - 9 = 6 + n$

$n = \dots\dots\dots$
(2)

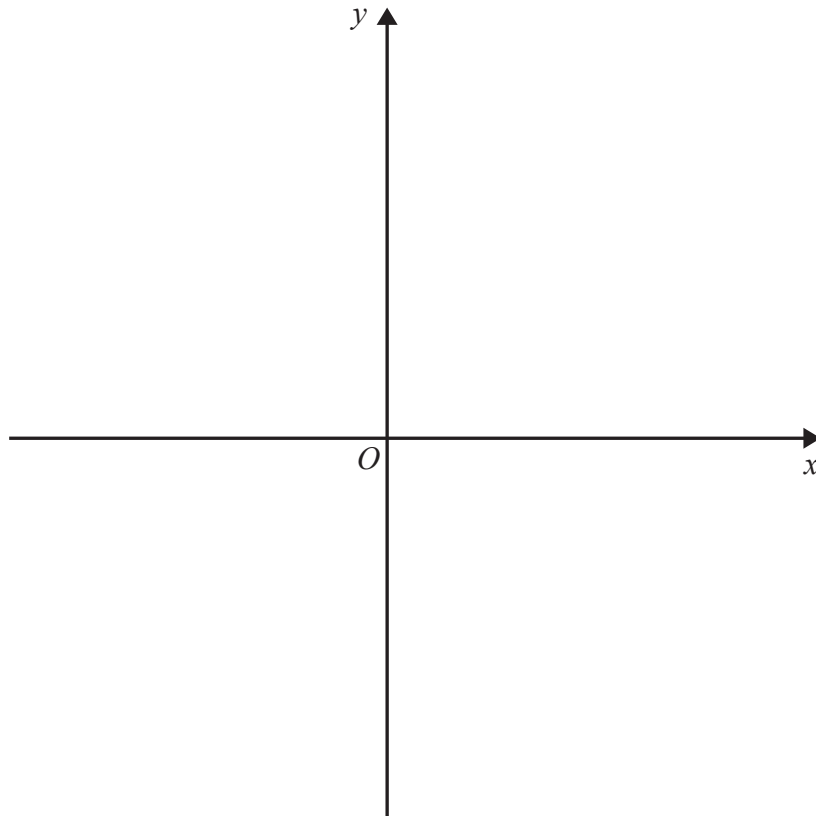
(c) Solve $\frac{2x + 6}{3} = 7$

$x = \dots\dots\dots$
(3)

(Total for Question 3 is 7 marks)



4 (a) Sketch the graph of $y = 25 - x^2$



(3)

(b) Describe what happens to the value of y as the value of x becomes very large.

(1)

(Total for Question 4 is 4 marks)



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5 Nina buys x red roses and y pink roses.

(a) Write down an expression, in terms of x and y , for the total number of roses Nina buys.

.....
(1)

Rita buys m bunches of tulips and v bunches of daffodils.

There are 12 tulips in each bunch of tulips.

There are 10 daffodils in each bunch of daffodils.

(b) Write down an expression, in terms of m and v , for the total number of tulips and daffodils Rita buys.

.....
(2)

(Total for Question 5 is 3 marks)



6 (a) Simplify $4x + 3y + 7a + 4y - x$

.....
(2)

(b) (i) Simplify $y^2 \times y^5$

.....
(1)

(ii) Simplify $\frac{n^7}{n^3}$

.....
(1)

(iii) Simplify $(6x^3)^2$

.....
(2)

(Total for Question 6 is 6 marks)



7 (a) Simplify $k \times k \times k \times k \times k$

.....
(1)

(b) Expand $5(2e + 3f)$

.....
(1)

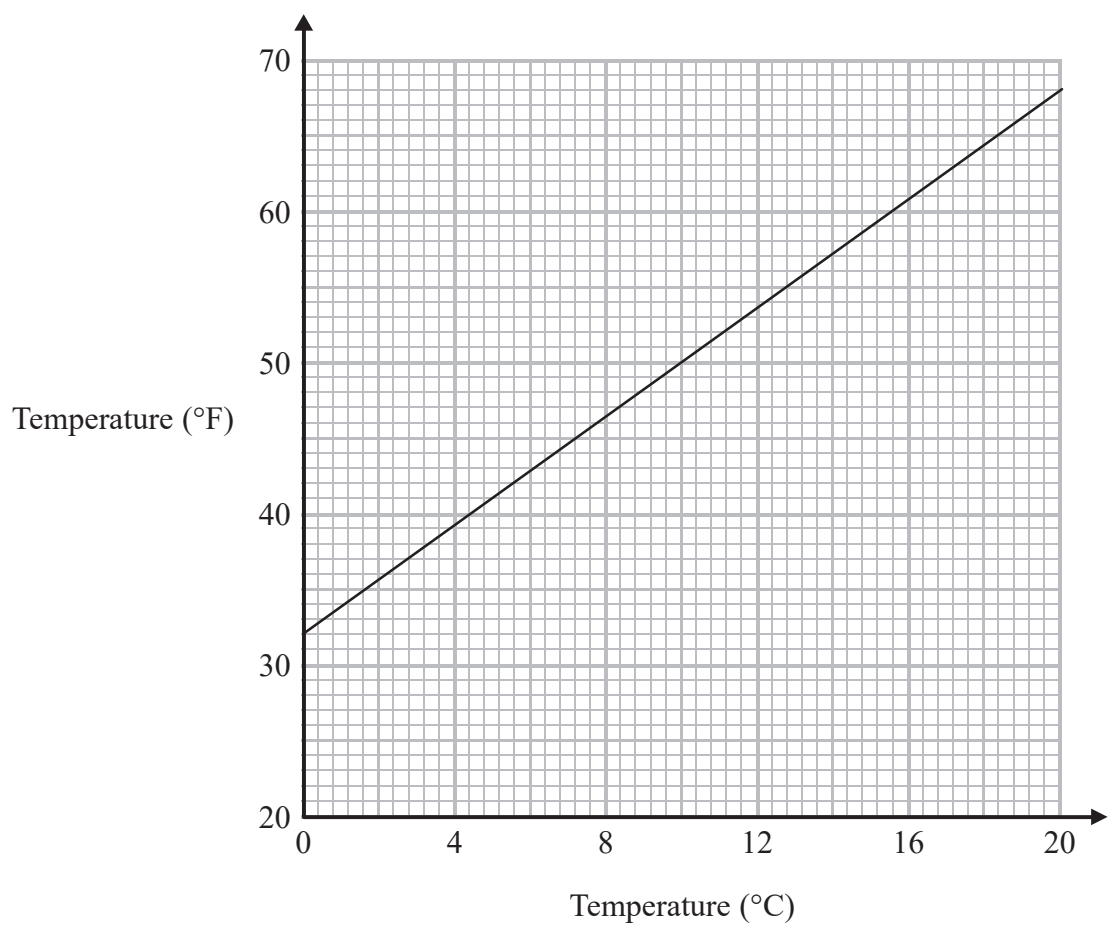
(c) Expand and simplify $6(x + 2y) - 3(x + y)$

.....
(2)

(Total for Question 7 is 4 marks)



8 The straight line graph can be used to change between a temperature in degrees Celsius ($^{\circ}\text{C}$) and a temperature in degrees Fahrenheit ($^{\circ}\text{F}$).



(a) Use the graph to change 10°C into $^{\circ}\text{F}$.

..... $^{\circ}\text{F}$
(1)

The temperature in Brian's garden increases from 4°C to 16°C .

(b) Work out the change in temperature in $^{\circ}\text{F}$.

..... $^{\circ}\text{F}$
(3)

(Total for Question 8 is 4 marks)



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9 (a) Factorise $6x + xy$

.....
(1)

(b) Factorise $3ab + 6abc$

.....
(2)

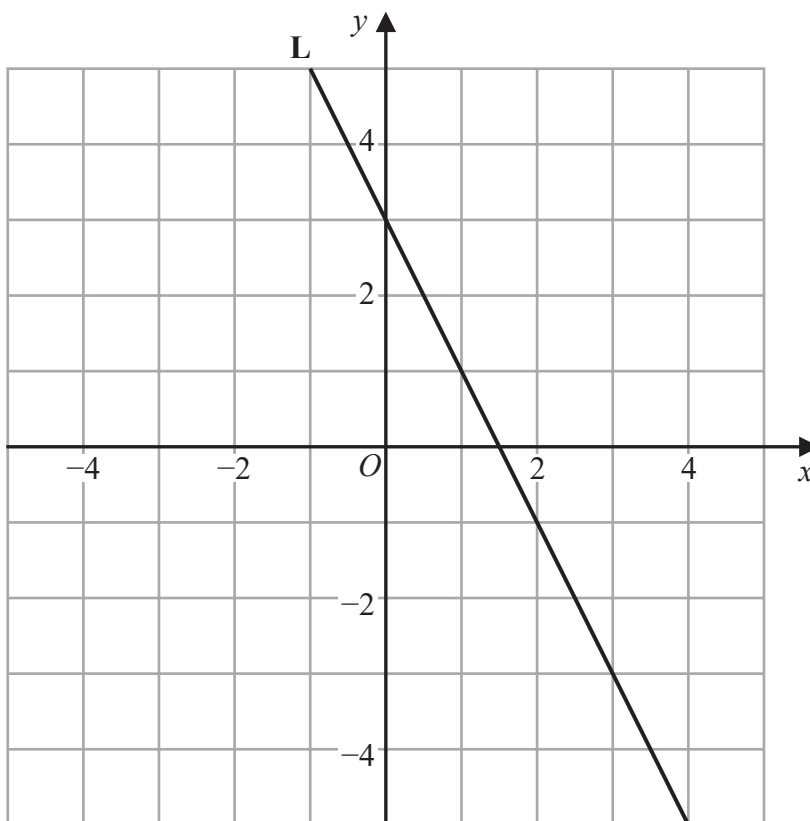
(c) Factorise $5w^2y - wy^2$

.....
(2)

(Total for Question 9 is 5 marks)



10 Here is a straight line **L** drawn on a grid.



(a) Find an equation for **L**.

.....
(3)

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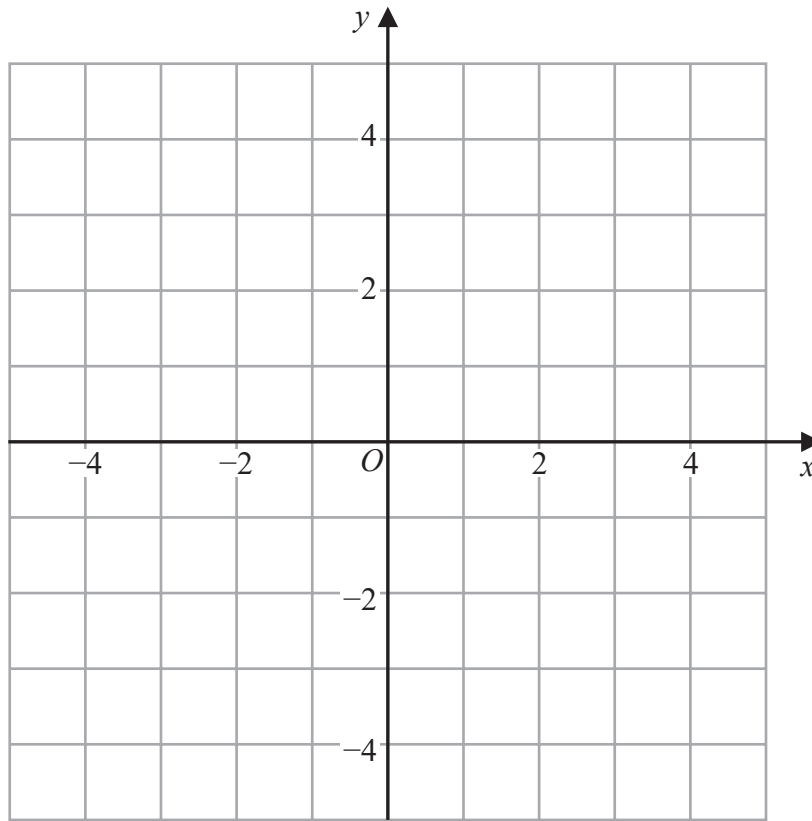


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(b) On the grid below, draw the graph of $y = 3$



(1)

(Total for Question 10 is 4 marks)



11 (a) Complete the table of values for $y = x^2 + 3x - 2$

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

(2)

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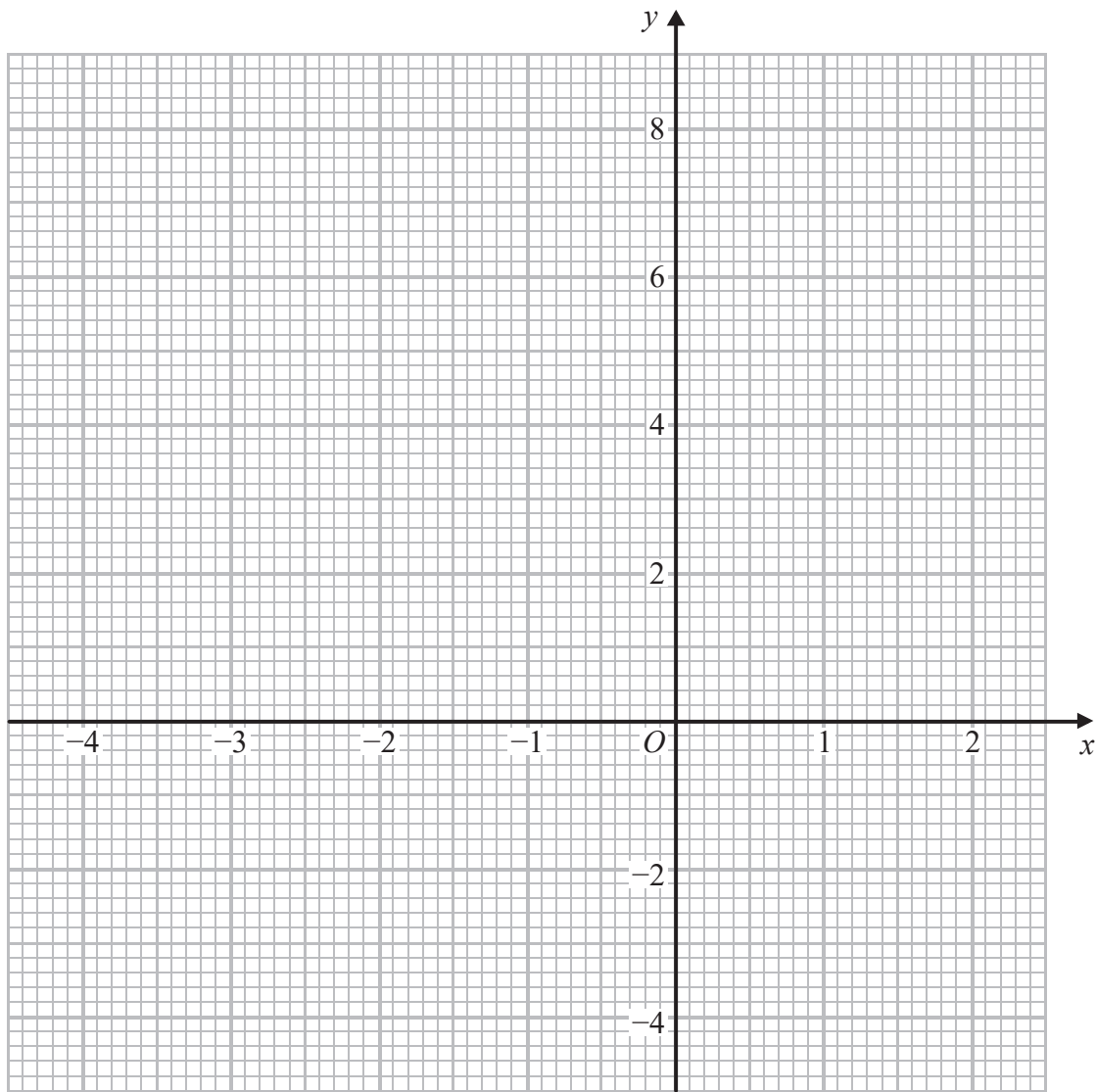


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(b) On the grid, draw the graph of $y = x^2 + 3x - 2$ for values of x from -4 to 2



(2)

(c) Use your graph to find estimates for the solutions of $x^2 + 3x - 2 = 0$

.....
(2)

(Total for Question 11 is 6 marks)



12 Here is a formula $v = r^2h$

(a) Find the value of v when $r = 5$ and $h = 6$

$v = \dots\dots\dots$
(2)

(b) Find one value of r when $v = 80$ and $h = 5$

$r = \dots\dots\dots$
(2)

(c) Make h the subject of the formula $v = r^2h$

$\dots\dots\dots$
(1)

(Total for Question 12 is 5 marks)

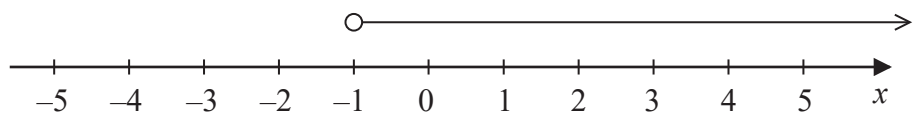


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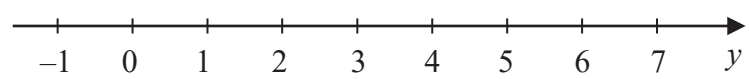
13 Here is an inequality in x shown on a number line.



(a) Write down the inequality.

.....
(1)

(b) On the number line below, show the inequality $1 < y \leq 6$



(2)

$n < 23$
 n is an integer.

(c) Write down the greatest possible value of n .

.....
(1)

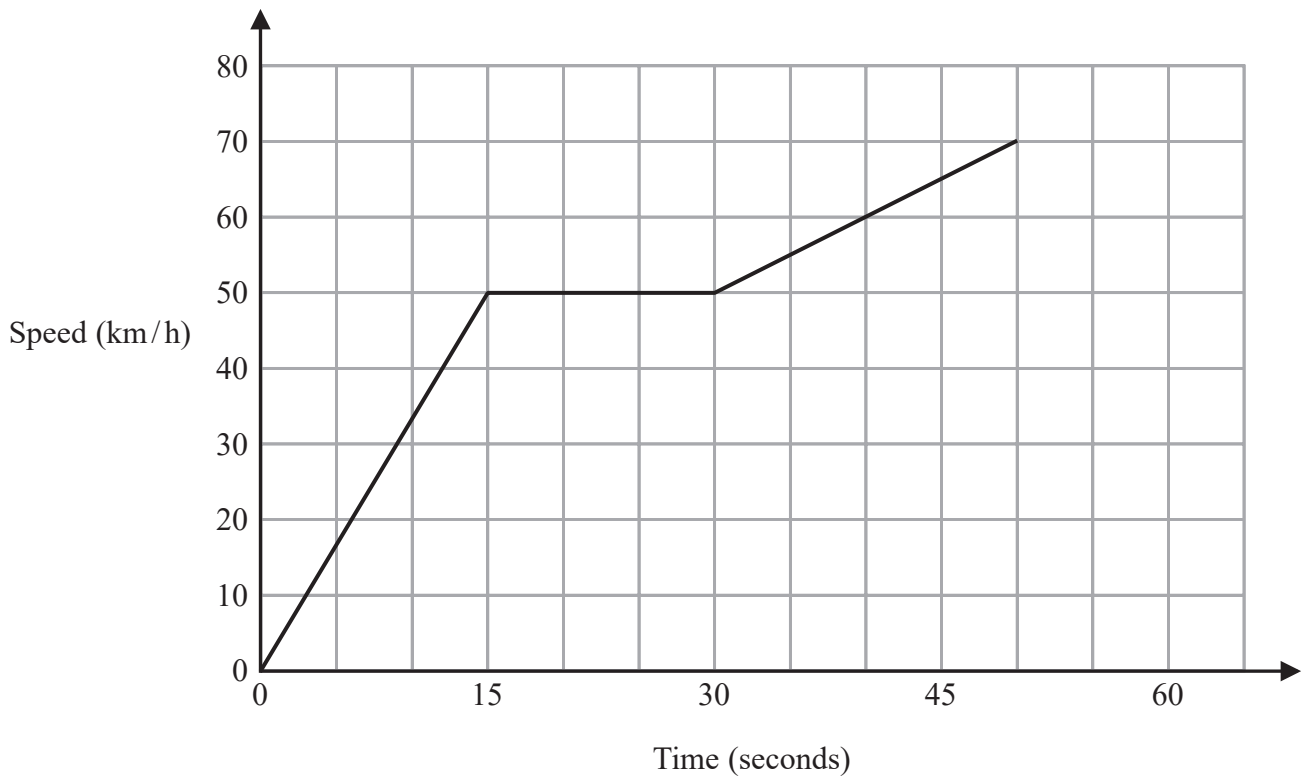
(d) Solve $\frac{7f}{3} + 5 < 19$

.....
(3)

(Total for Question 13 is 7 marks)



14 Here is part of a speed-time graph for a car's journey.



(a) Write down the speed at time 40 seconds.

..... km/h
(1)

(b) Write down the gradient of the line drawn from time 15 seconds to time 30 seconds.

.....
(1)

(Total for Question 14 is 2 marks)

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15 Here are the first four terms of an arithmetic sequence.

3 7 11 15

(a) (i) Write down the next term of this sequence.

.....
(1)

(ii) Find the 9th term of this sequence.

.....
(1)

(iii) Find an expression, in terms of n , for the n th term of this sequence.

.....
(2)

The n th term of a different arithmetic sequence is given by the expression $7 - 2n$

(b) (i) Find the 3rd term of this sequence.

.....
(2)

(ii) Is 17 a term of this sequence?
Give a reason for your answer.

.....
.....
(2)

(Total for Question 15 is 8 marks)



16 On Wednesday, Luke goes to the gym on his way home from work.

The table shows information about the activities he does between leaving work and arriving home.

Activity	Time taken (minutes)
Drive from work to gym	25
Exercise at gym	e
Drive from gym to home	15

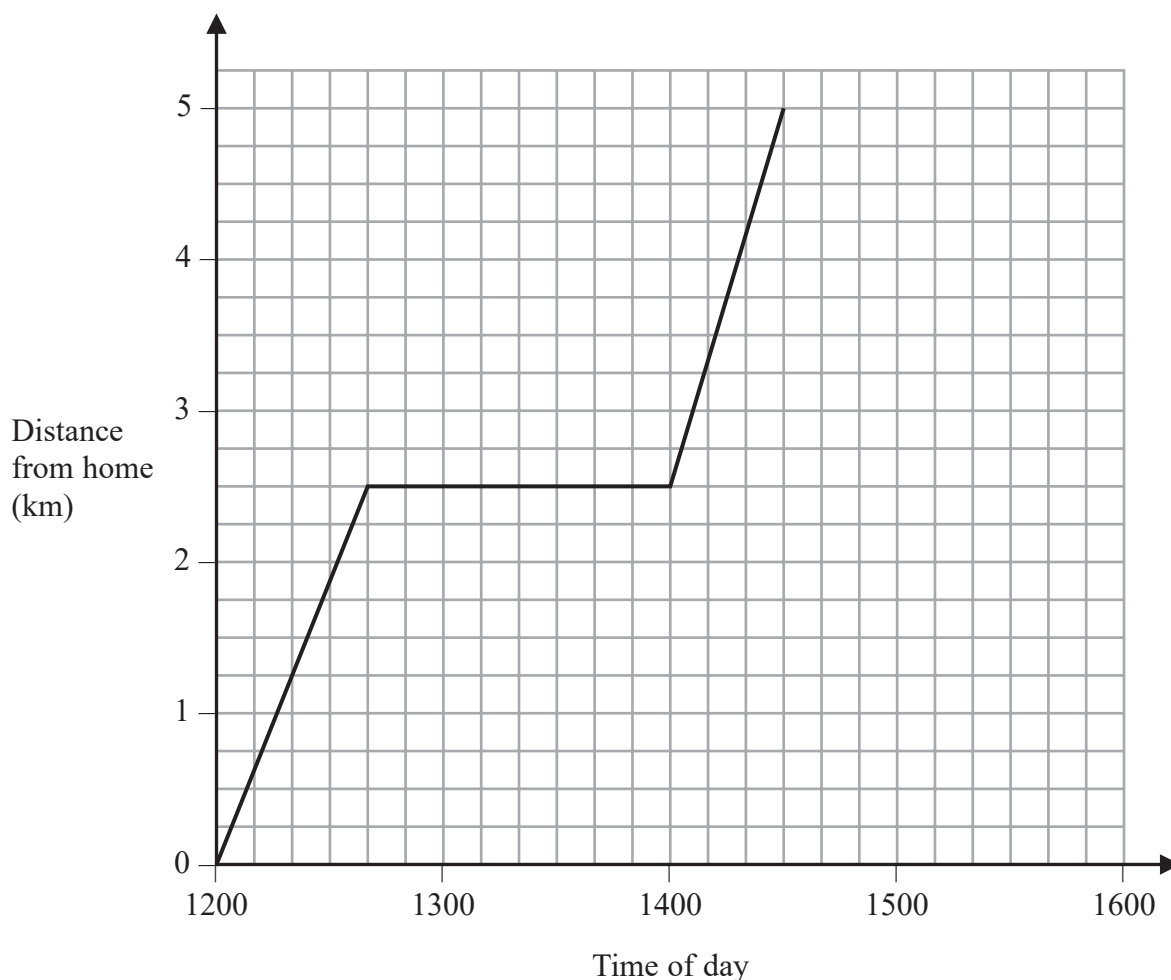
(a) Write down an expression for the total length of time, in minutes, taken by these activities.

..... minutes
(1)

On Sunday, Luke

walks from his home to the gym
exercises at the gym
and then walks to his friend's house.

Here is the travel graph for this journey.



(b) How many minutes is Luke at the gym on Sunday?

..... minutes

(1)

(c) Work out Luke's speed as he walks from the gym to his friend's house.

Give your answer in km/h.

..... km/h

(2)

Luke stays at his friend's house for 30 minutes.

He then walks back to the gym at a steady speed.

It takes him 40 minutes to walk back to the gym.

(d) Represent this information on the travel graph.

(2)

(Total for Question 16 is 6 marks)



17 Solve $3x - 8 = \frac{5x}{2} + 4$

$x = \dots\dots\dots$

(Total for Question 17 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS

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