

## Practice Paper 2

### Edexcel Linear Specification

# Higher Tier

June 2013



We offer this paper as a service, but make no great claims as to its accuracy.

**Time: 1 hour 45 minutes**

**Marks: 100**

#### Advice

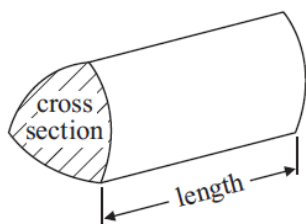
- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

## GCSE Mathematics IMA0

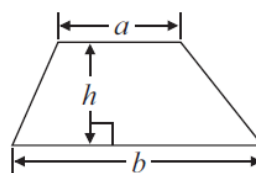
Formulae: Higher Tier

**You must not write on this formulae page.  
Anything you write on this formulae page will gain NO credit.**

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

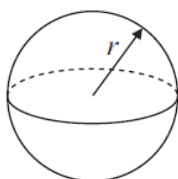


**Area of trapezium** =  $\frac{1}{2} (a + b)h$



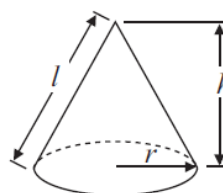
**Volume of sphere** =  $\frac{4}{3} \pi r^3$

**Surface area of sphere** =  $4\pi r^2$

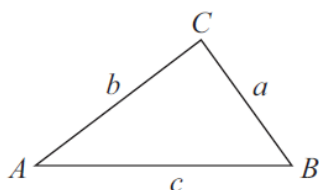


**Volume of cone** =  $\frac{1}{3} \pi r^2 h$

**Curved surface area of cone** =  $\pi r l$



**In any triangle ABC**



**The Quadratic Equation**

The solutions of  $ax^2 + bx + c = 0$   
where  $a \neq 0$ , are given by

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

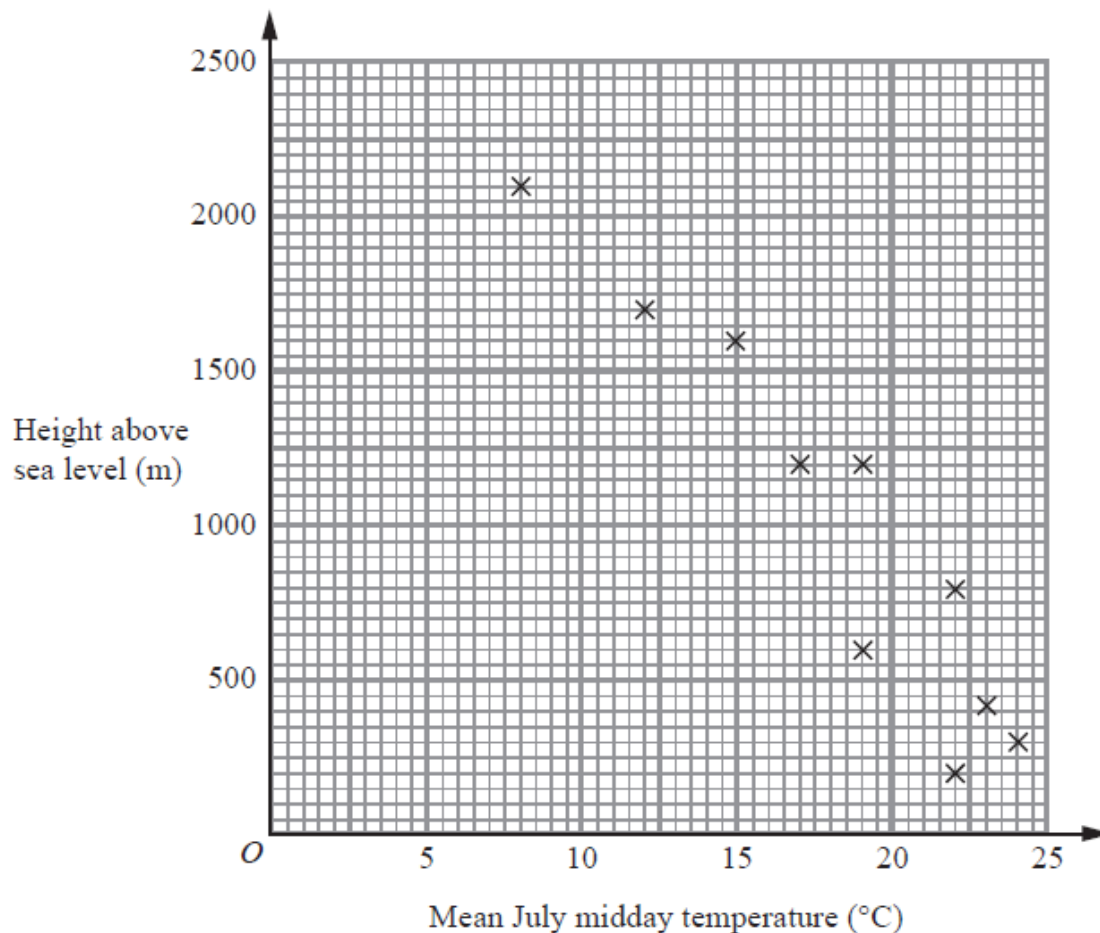
**Sine Rule**  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

**Cosine Rule**  $a^2 = b^2 + c^2 - 2bc \cos A$

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

### Question 1

The scatter graph shows information for some weather stations. It shows the height of each weather station above sea level (m) and the mean July midday temperature ( $^{\circ}\text{C}$ ) for that weather station.



The table shows this information for two more weather stations.

Height of weather station above sea level (m)	1000	500
Mean July midday temperature ( $^{\circ}\text{C}$ )	20	22

- (a) Plot this information on the scatter graph. (1)
- (b) What type of correlation does this scatter graph show?  
..... (1)
- (c) Draw a line of best fit on the scatter graph. (1)

A weather station is 1800 metres above sea level.

(d) Estimate the mean July midday temperature for this weather station.

..... °C  
(1)

At another weather station the mean July midday temperature is 18°C.

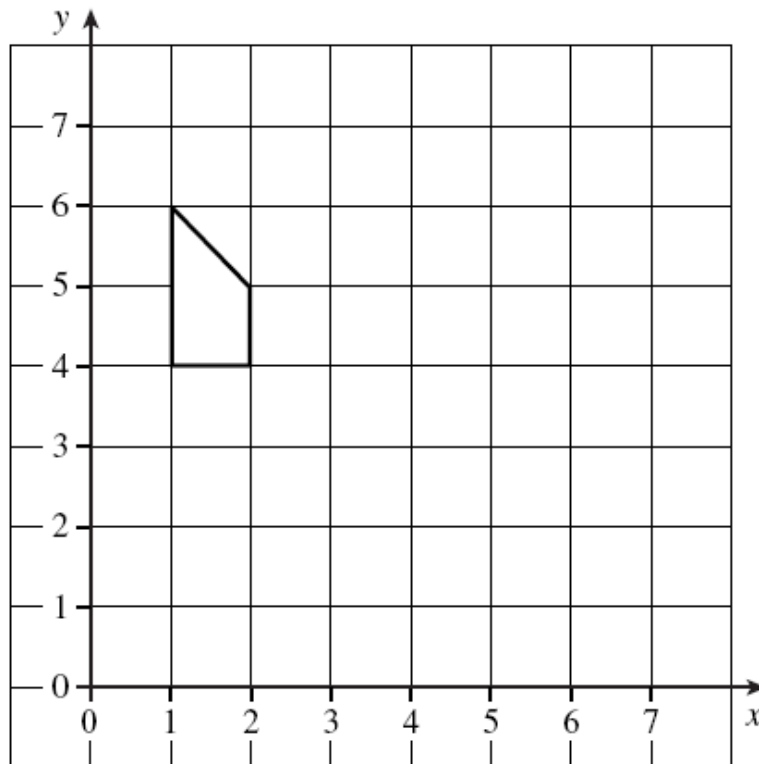
(e) Estimate the height above sea level of this weather station.

..... m  
(1)

**(Total 5 marks)**

## Question 2

Enlarge the shape in the diagram by a scale factor of 3, centre (0, 6).



(2 marks)

### Question 3

. Here are the ingredients for making cheese pie for 6 people.

Cheese pie for 6 people
180 g flour
240 g cheese
80 g butter
4 eggs
160 ml milk

Bill makes a cheese pie for 3 people.

(a) Work out how much flour he needs.

..... g  
(2)

Jenny makes a cheese pie for 15 people.

(b) Work out how much milk she needs.

..... ml  
(2)

**(Total 4 marks)**

**Question 4**

Use your calculator to work out

$$\frac{22.4 \times 14.5}{8.5 \times 3.2}$$

Write down all the figures on your calculator display.

.....  
(Total 2 marks)

**Question 5**



**Ben's Tyre Shop**

Mini prices for Tyres

<i>Tyres for Minis</i>	<b>Price</b>
Goodweek	£65
Dunlap	£62
Bridgearth	£75
Pirello	£69
Valves	50p per tyre
Balancing	£1 per tyre

Des buys two Dunlap tyres with valves and balancing and has to pay VAT at 15%.

(a) Work out the total amount Des pays for the tyres.

(3)

£ .....



Ben sees Dunlap tyres offered for sale in a different garage.  
He wants to compare the prices before VAT was added.

(b) What is the price of these tyres before VAT was added?

(2)

<p style="text-align: center;"><b>Tyre Sale</b></p> <p style="text-align: center;"><b>Dunlap tyres for Minis</b> <b>(including valves and balancing)</b></p> <p style="text-align: center;"><b>£71.30</b> <b>including VAT at 15%</b></p>
---

£ .....

In 2010 the VAT rate is to be increased from 15% to 17½%.

(c) By what number will Ben have to multiply the old prices by to give the new prices including VAT?

(2)

£ .....

**(Total 7 marks)**

**Question 6**

(b)  $S = \frac{1}{2}at^2$

Find the value of  $S$  when  $t = 3$  and  $a = \frac{1}{4}$

$S = \dots\dots\dots$   
(2)

(c) Factorise  $x^2 - 5x$

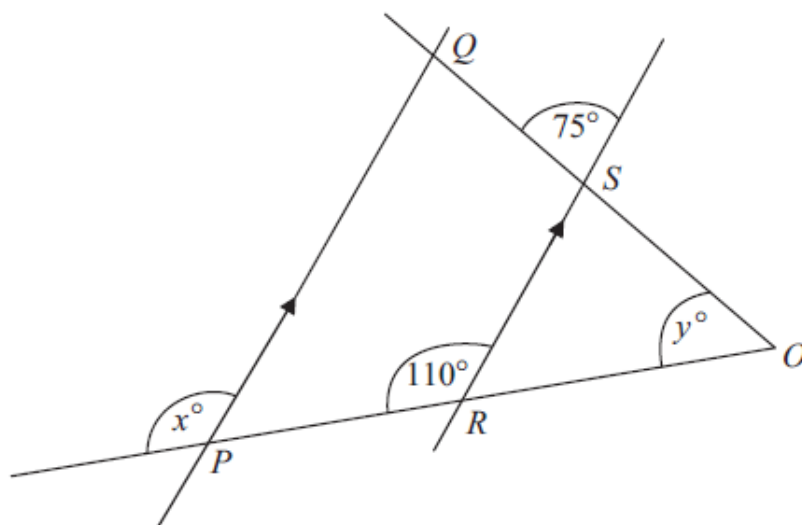
$\dots\dots\dots$   
(2)

(d) Expand and simplify  $(x + 3)(x + 4)$

$\dots\dots\dots$   
(2)

**Question 7**

Diagram NOT  
accurately drawn



*PQ* is parallel to *RS*.

*OSQ* and *ORP* are straight lines.

(a) (i) Write down the value of  $x$ .

$x = \dots\dots\dots$

(ii) Give a reason for your answer.

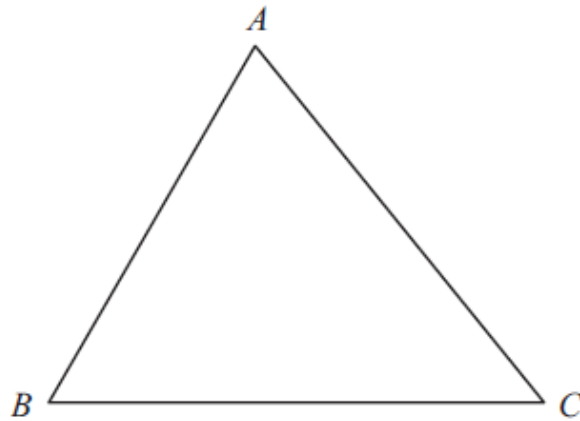
.....  
(2)

(b) Work out the value of  $y$ .

$y = \dots\dots\dots$   
(2)

**(Total 4 marks)**

**Question 8**



$ABC$  is a triangle.

Shade the region inside the triangle which is **both**

**and** less than 4 centimetres from the point  $B$   
closer to the line  $AC$  than the line  $AB$ .

**(Total 4 marks)**

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**Question 9**

Mr Weaver's garden is in the shape of a rectangle.

In the garden

there is a patio in the shape of a rectangle  
and two ponds in the shape of circles with diameter 3.8 m.

The rest of the garden is grass.

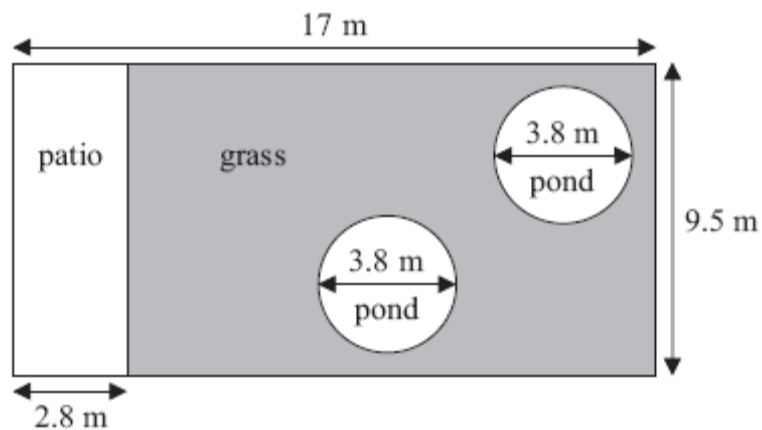


Diagram NOT  
accurately drawn

Mr Weaver is going to spread fertiliser over all the grass.  
One box of fertiliser will cover 25 m<sup>2</sup> of grass.

How many boxes of fertiliser does Mr Weaver need?  
You must show your working.

(Total is 5 marks)

**Question 10**

Simon wants to find out how much people spend using their mobile phone.

He uses this question on a questionnaire.

How much do you spend using your mobile phone?		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
£1–£5	£5–£10	£10–£15

(a) Write down **two** things that are wrong with this question.

1 .....

.....

2 .....

.....

(2)

(b) Design a better question for his questionnaire to find out how much people spend using their mobile phone.

You should include some response boxes.

(2)

(Total 4 marks)

**Question 11**

The value of a car depreciates by 35% each year.

At the end of 2007 the value of the car was £5460

Work out the value of the car at the end of 2006

£ .....

**(Total 3 marks)**

**Question 12**

Colin goes to Switzerland.  
The exchange rate is £1 = 2.30 francs.

He changes £400 into francs.

(a) How many francs should he get?

..... francs  
(2)

In Switzerland, Colin buys a hat.  
The cost of the hat is 46 francs.

(b) Work out the cost of the hat in pounds.

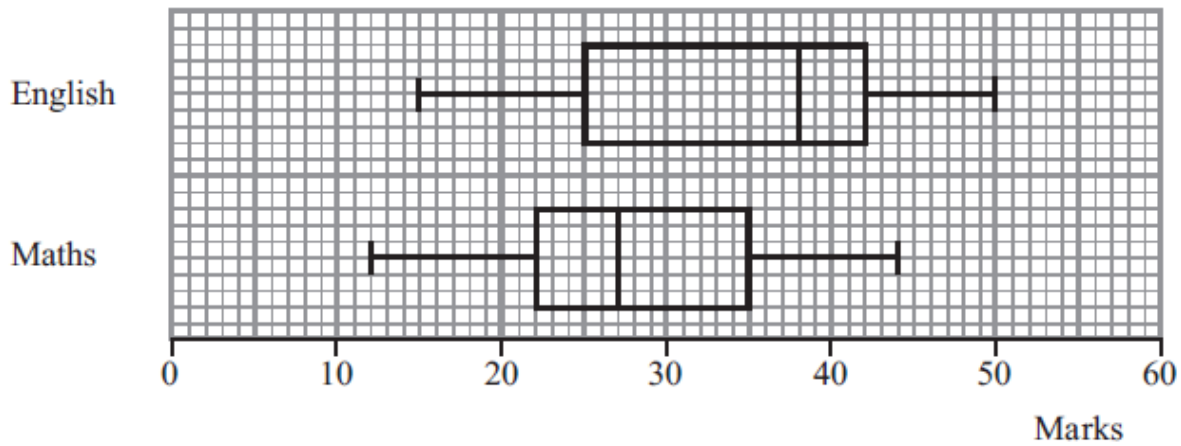
£ .....  
(2)

**(Total 4 marks)**



**Question 13**

The box plots show the distribution of marks in an English test and in a Maths test for a group of students.



(a) What is the highest mark in the English test?

.....  
(1)

(b) Compare the distributions of the marks in the English test and marks in the Maths test.

1 .....

.....

2 .....

.....  
(2)

**(Total 3 marks)**

### **Question 14**

The equation

$$x^3 + 2x = 26$$

has a solution between 2 and 3

Use a trial and improvement method to find this solution.

Give your answer correct to one decimal place.

You must show **all** your working.

$x = \dots\dots\dots$

**(Total 4 marks)**

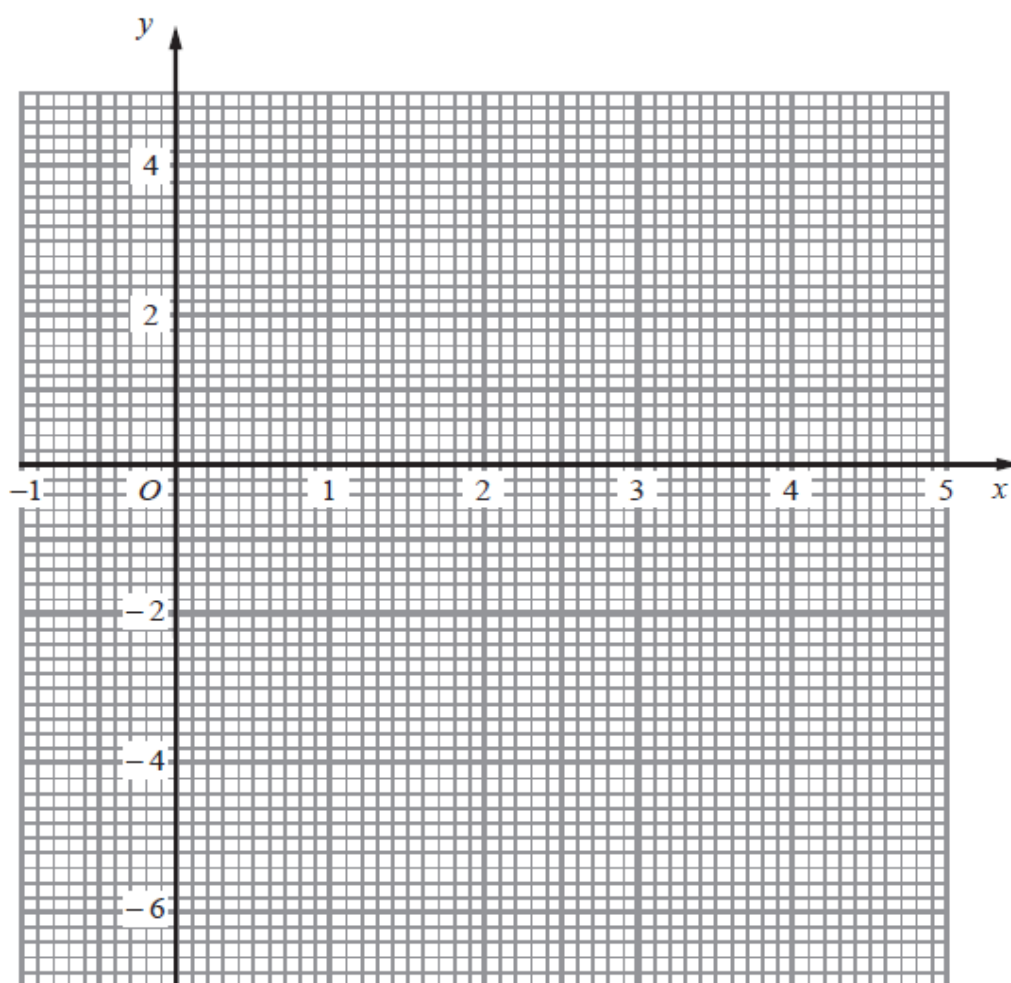
### Question 15

(a) Complete the table of values for  $y = x^2 - 4x - 2$

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

(2)

(b) On the grid, draw the graph of  $y = x^2 - 4x - 2$



(2)

(c) Use your graph to estimate the values of  $x$  when  $y = -3$

$x = \dots\dots\dots$

$x = \dots\dots\dots$

(2)

(Total 6 marks)

### Question 16

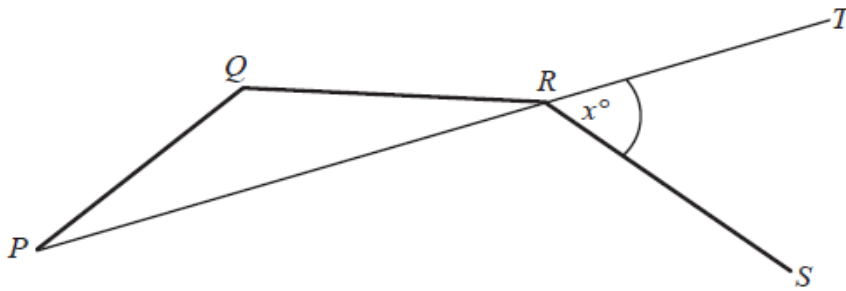


Diagram NOT  
accurately drawn

*PQ*, *QR* and *RS* are 3 sides of a regular decagon.  
*PRT* is a straight line.  
Angle *TRS* =  $x^\circ$

Work out the value of  $x$

$x = \dots\dots\dots$

(Total for Question 4 = 5 marks)

**Question 17**

$q$  is inversely proportional to the square of  $t$ .

When  $t = 4$ ,  $q = 8.5$

(a) Find a formula for  $q$  in terms of  $t$ .

$q = \dots\dots\dots$   
(3)

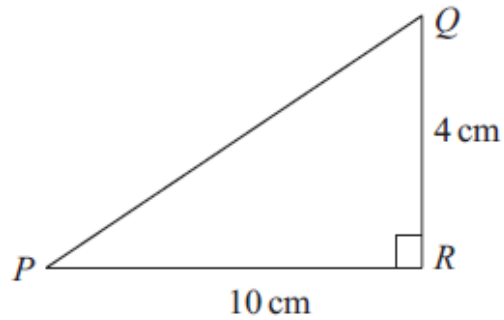
(b) Calculate the value of  $q$  when  $t = 5$

$\dots\dots\dots$   
(1)

**(Total 4 marks)**

**Question 18**

Diagram **NOT**  
accurately drawn



$PQR$  is a right-angled triangle.

$QR = 4 \text{ cm}$   
 $PR = 10 \text{ cm}$

Work out the size of angle  $RPQ$ .  
Give your answer correct to 3 significant figures.

.....  
o

**(Total 3 marks)**

**Question 19**

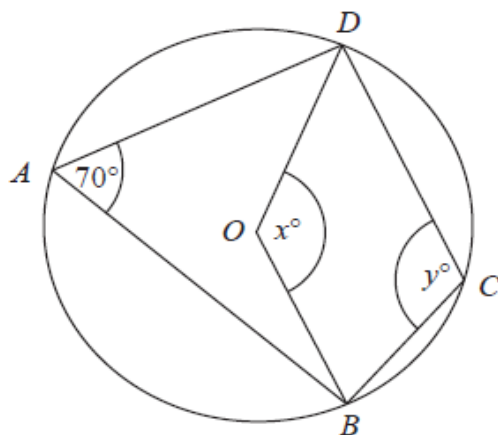


Diagram NOT accurately drawn

In the diagram,  $A$ ,  $B$ ,  $C$  and  $D$  are points on the circumference of a circle, centre  $O$ .  
 Angle  $BAD = 70^\circ$ .  
 Angle  $BOD = x^\circ$ .  
 Angle  $BCD = y^\circ$ .

(a) (i) Work out the value of  $x$ .

$x = \dots\dots\dots$

(ii) Give a reason for your answer.

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

(b) (i) Work out the value of  $y$ .

$y = \dots\dots\dots$

(ii) Give a reason for your answer.

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

**(Total 4 marks)**

**Question 20**

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

.....  
**(Total 5 marks)**



**Question 21**

(a) Rationalise the denominator of  $\frac{1}{\sqrt{3}}$

.....  
(1)

(b) Expand  $(2 + \sqrt{3})(1 + \sqrt{3})$

Give your answer in the form  $a + b\sqrt{3}$ , where  $a$  and  $b$  are integers.

.....  
(2)

**(Total 3 marks)**

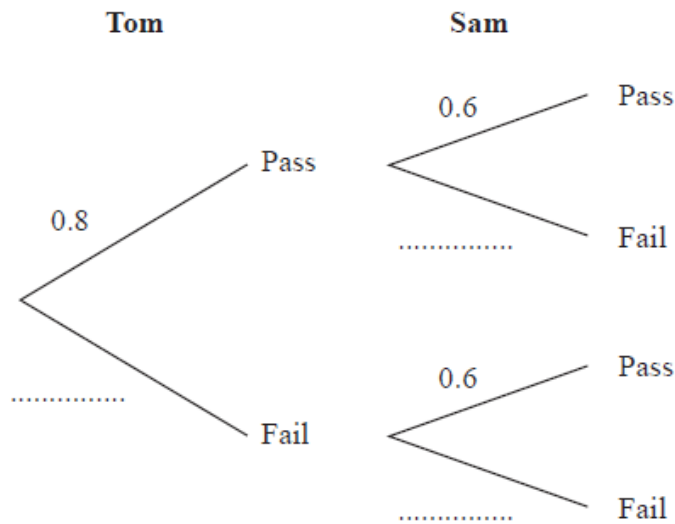
**Question 22**

Tom and Sam each take a driving test.

The probability that Tom will pass the driving test is 0.8

The probability that Sam will pass the driving test is 0.6

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that both Tom and Sam will pass the driving test.

.....  
(2)

(c) Work out the probability that only one of them will pass the driving test.

.....  
(3)

**(Total 7 marks)**

**Question 23**

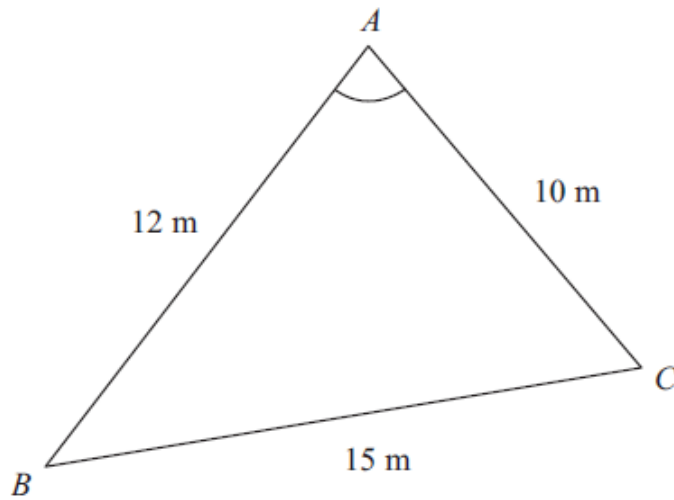


Diagram **NOT**  
accurately drawn

*ABC* is a triangle.

*AB* = 12 m.

*AC* = 10 m.

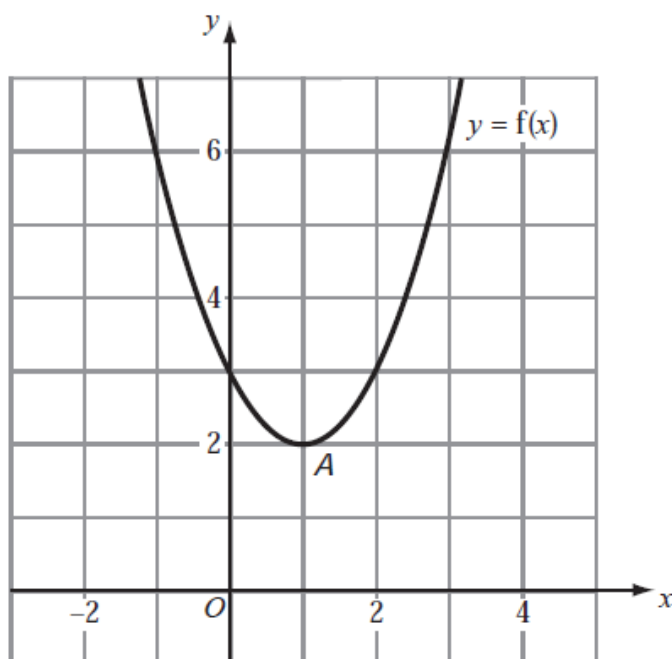
*BC* = 15 m.

Calculate the size of angle *BAC*.

Give your answer correct to one decimal place.

.....  
(Total 3 marks)

**Question 24**



The diagram shows the graph of  $y = f(x)$ .

The only vertex of the graph is  $A$  at  $(1, 2)$ .

Write down the coordinates of the vertex of the curve with equation.

(a) (i)  $y = f(x) + 3$

(1)

.....

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

(1)

.....

The curve with equation  $y = f(x)$  is transformed to give the curve with equation  $y = -f(x)$

(b) Describe the transformation.

(1)

(Total 3 marks)

**This is the end of the paper**