Write your name here

Surname	Other names

Pearson Edexcel
Level 1/Level 2 GCSE (9-1)

Centre Number

Candidate Number

Mathematics
Paper 2 (Calculator)

Foundation Tier

Sample Assessment Materials for first teaching September 2015
Time: 1 hour 30 minutes

Paper Reference
1MA1/2F

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, 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 may be used.**
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must **show all your working out** with your **answer clearly identified** at the **end of your solution**.

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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PEARSON

Formulae Sheet

Perimeter, area, surface area and volume formulae

Where r is the radius of the sphere or cone, l is the slant height of a cone and h is the perpendicular height of a cone:

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

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

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

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

Kinematics formulae

Where a is constant acceleration, u is initial velocity, v is final velocity, s is displacement from the position when $t = 0$ and t is time:

$$v = u + at$$

$$s = ut + \frac{1}{2}at^2$$

$$v^2 = u^2 + 2as$$

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1   Ellen buys items from car boot sales.
    She then sells these items on an internet auction site.

    The table shows some information about the items Ellen bought and sold one week.
    The first row has been completed.

Item	Bought	Sold	Profit or loss
DVD	£5	£7.50	£2.50 profit
Doll	£8	£12	....
Jigsaw	£2	....	£1.50 profit
Chair	....	£20	£5 loss
Train set	£37	£35	....

(a) Complete the table.

(2)

(b) Work out Ellen's total profit or loss for these five items.

(2)

(Total for Question 1 is 4 marks)

2 (a) Find the value of $\sqrt{1.6 + 0.96}$

(1)

(b) Find the value of 1.2^4

(1)

(c) Write 37.483 correct to 1 significant figure.

(1)

(Total for Question 2 is 3 marks)

3 (a) Simplify $c + c + c + c$

(1)

(b) Simplify $6 \times m \times 5$
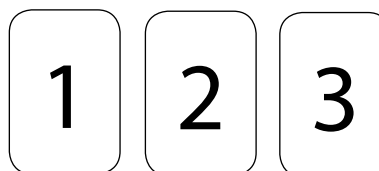
(1)

(c) Simplify $2e + 3f + 7e - 5f$

(2)

(d) Expand and simplify $(x + 3)(x + 5)$

(2)

(Total for Question 3 is 6 marks)

4 (a) Write the ratio 48 : 120 in its simplest form.

(2)

Sally has three tiles.
Each tile has a different number on it.
Sally puts the three tiles down to make a number.
Each number is made with all three tiles.

1 **2** **3**

(b) How many different numbers can Sally make?

(2)

There are 60 animals at a rescue centre.

30% of the animals are cats.
38 of the animals are dogs.

The rest of the animals are horses.

(c) Work out how many horses there are at the rescue centre.

(3)

(Total for Question 4 is 7 marks)

5 Ade sells shirts in 4 sizes.
The sizes are small (S), medium (M), large (L) and extra large (XL).

Here are the sizes of the shirts that Ade sold in each of two weeks.

Week 1 S   L   M   L   XL   M   L   S   L   L
             M   XL   S   L   M   M   L   L   M   M

Week 2 M   M   L   L   L   XL   S   S
             L   XL   S   M   M   L   M   M

(a) (i) Draw a suitable diagram that Ade could use to compare the sizes of shirts sold
         in week 1 with the sizes of shirts sold in week 2
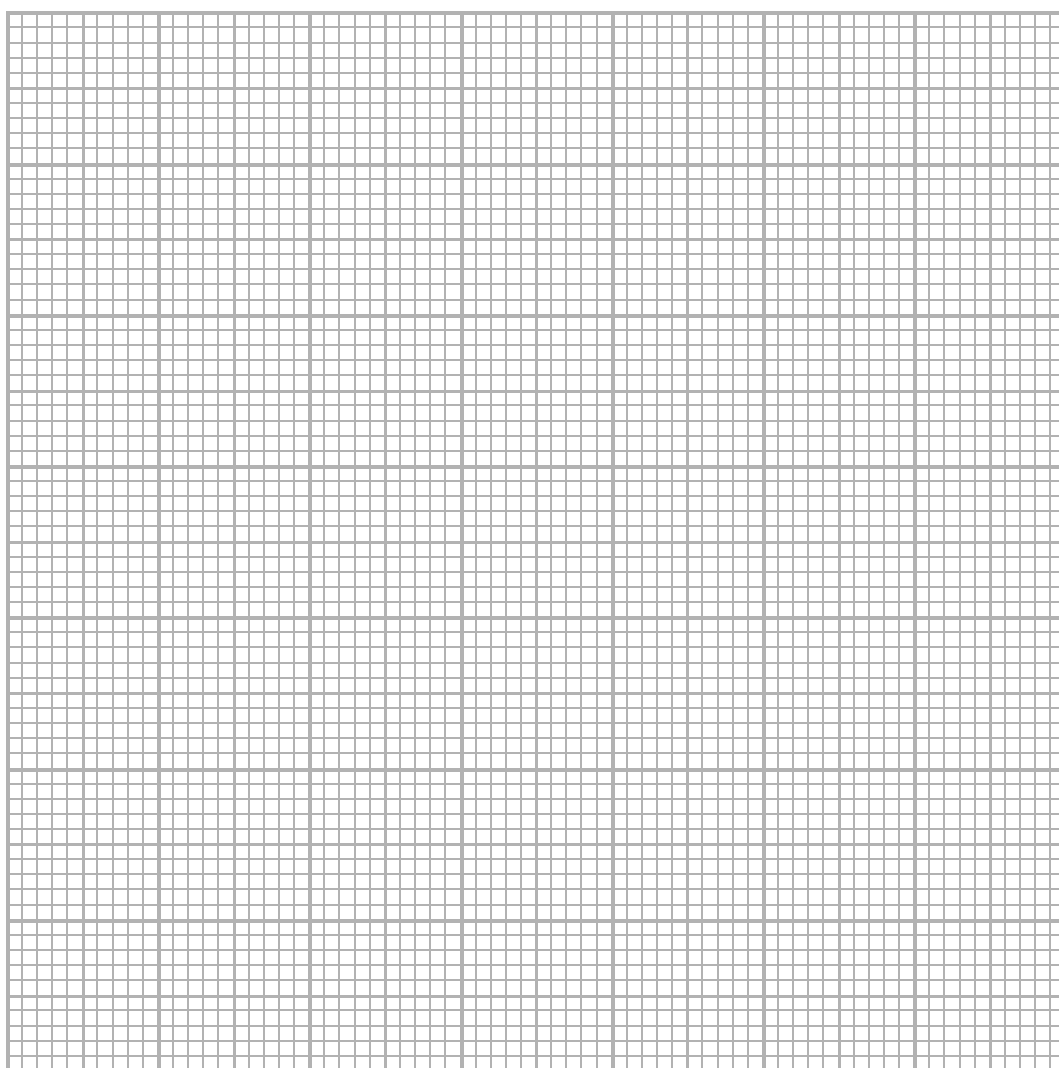
(ii) Explain how the diagram you have chosen allows the sizes of the shirts sold in week 1 to be compared with the sizes of the shirts sold in week 2.
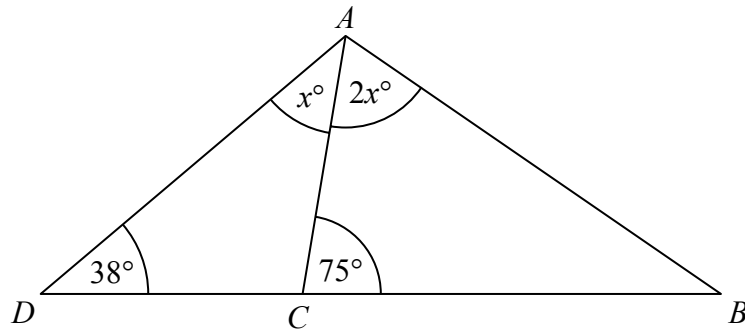
(4)

Ade buys 240 more shirts to sell.

(b) (i) Work out an estimate of the number of size large (L) shirts Ade should buy.

(ii) Explain whether your answer to part (b)(i) gives a reliable estimate of the number of size large (L) shirts Ade should buy.

(3)

(Total for Question 5 is 7 marks)

6

ABD is a triangle.
C is a point on *BD*.

Show that angle *ABD* is 31°.
Give a reason for each stage in your working.

(Total for Question 6 is 4 marks)

7 Noah buys coffee sachets to use in his coffee maker.

There are 16 coffee sachets in a pack.

A pack costs £3.99

Noah uses 5 coffee sachets each day.

Work out the minimum amount that Noah spends on coffee sachets in one year.

(Total for Question 7 is 4 marks)

8 Delia uses this rule to cook some beef.

> Cooking time in minutes = 20 × weight in pounds + 30

The weight of the beef is 1.5 kg.
1 kg = 2.2 pounds.

(a) How long will the beef take to cook?

(4)

Kevin has a different piece of beef.
The weight of his beef is 3 kg.

Kevin says

'Because the weight of my piece of beef is twice the weight of Delia's piece of beef it
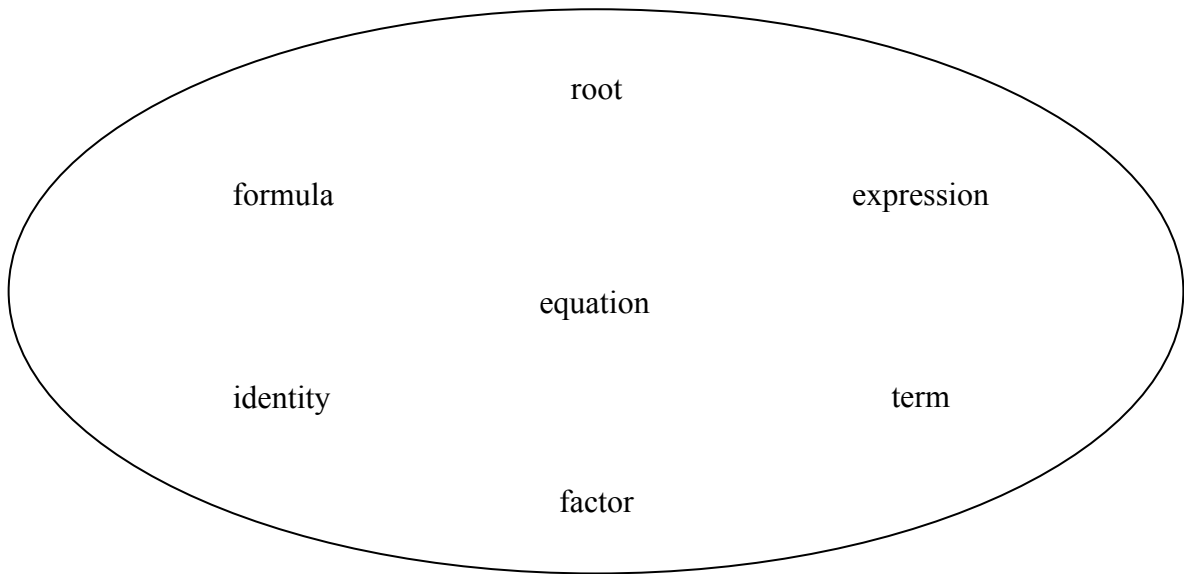will take twice as long to cook as Delia's piece took.'

(b) Is Kevin correct?
Explain your answer.

(1)

(Total for Question 8 is 5 marks)

9

root

formula   expression

equation

identity   term

factor

Choose a word from those above that makes this statement correct.

(a) x^2 is a .... in $x^2 + 4y$

(1)

Choose a word from those above that makes this statement correct.

(b) $(y + 2)$ is a .... of $3y + 6$

(1)

(Total for Question 9 is 2 marks)

10 Brian, Suha and Kamil pick apples.

Suha picks twice as many apples as Brian.
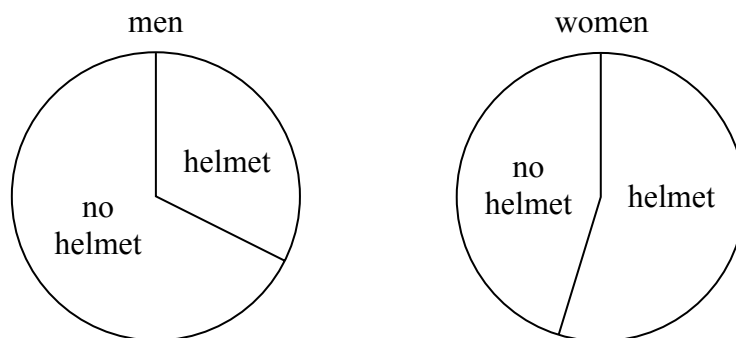Kamil picks nine more apples than Suha.

They pick a total of 94 apples.

How many apples does Brian pick?

(Total for Question 10 is 4 marks)

11 Imran carried out a survey on the wearing of cycle helmets by the men and the women living in his village.

He used the information he collected to draw two pie charts.

Mary looks at the two pie charts.

She says:

"The pie charts show that more women wear helmets than men."

(a) Is Mary right?
You must explain your answer.

(1)

Imran chose to draw pie charts to display the results of his survey.

(b) Are pie charts the best way to show this information?
You must explain your answer.

(1)

(Total for Question 11 is 2 marks)

12 Ashten chooses three different whole numbers between 1 and 50

The first number is a prime number.
The second number is 4 times the first number.
The third number is 6 less than the second number.

The sum of the three numbers is greater than 57

Find the three numbers.

(Total for Question 12 is 3 marks)

13 Given that $3(x - c) = 2x + 5$ where c is an integer,

show that x cannot be a multiple of six.

(Total for Question 13 is 3 marks)

14 Jane made some almond biscuits which she sold at a fête.

She had:

5 kg of flour
3 kg of butter
2.5 kg of icing sugar
320 g of almonds

Here is the list of ingredients for making 24 almond biscuits.

> Ingredients for 24 almond biscuits
>
> 150 g flour
> 100 g butter
> 75 g icing sugar
> 10 g almonds

Jane made as many almond biscuits as she could, using the ingredients she had.

(a) Work out how many almond biscuits she made.

(3)

Jane sold 70% of the biscuits she made for 25p each.
She sold the other 30% at 4 for 55p.

The ingredients Jane used cost her £45 and the total of all other costs was £27

(b) Work out the percentage profit.

(6)

(Total for Question 14 is 9 marks)

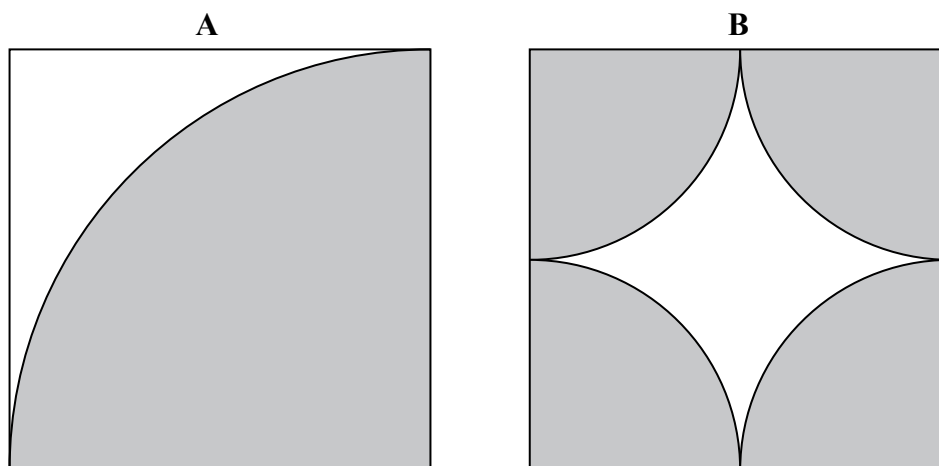**15** The diagrams show two identical squares.

Diagram **A** shows a quarter of a circle shaded inside the square.
Diagram **B** shows four identical quarter circles shaded inside the square.

Show that the area of the region shaded in diagram **A** is equal to the area of the region shaded in diagram **B**.

(Total for Question 15 is 3 marks)

16 Here is part of a map showing the position of a port *A*.

N
↑
|
|
|
|
A ×
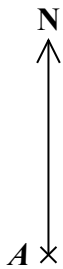
B is a lighthouse 36 km from *A* on a bearing of 050°

(a) (i) Construct a diagram to show the position of *B*.
Use a scale of 1 cm represents 4 km.

(ii) Write down the bearing of *A* from *B*.

(3)

From the lighthouse at *B*, ships can be seen when they are within a range of 23 km of *B*.
A ship sails due East from *A*.

(b) Show, **by calculation**, that on this course this ship will not be seen from the lighthouse at *B*.

You must not use a scale drawing.

(4)

(Total for Question 16 is 7 marks)

17 A piece of wood has a mass of x kg and a volume of 0.002 m^3.

Show that the density of the wood is 0.5x g/cm^3.

(Total for Question 17 is 4 marks)

18 Polly and Fiona play each other at chess and at snooker.

The probability that Polly wins at chess is 0.6
The probability that Polly wins at snooker is 0.7

Work out the probability that Polly does not win both games.

(Total for Question 18 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS

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Foundation tier Paper 2 – Calculator

Question	Working	Answer	Mark type	AO	Notes
1 (a)		Doll: £4 profit Jigsaw: £3.50 Chair: £25 Train set: £2 loss	M	1.3a	M1 for any correct method to find profit or loss and any correct method to find cost or selling prices (this may be given for the sight of at least one correct entry in the **profit or loss** column and one correct entry in **bought** or **sold** columns)
			A	1.3a	A1 for a fully correct table with units and 'profit' or 'loss' quoted as required
1 (b)		£1 profit	M A	1.3a 1.3a	M1 for a fully correct method to find profit or loss A1 for £1 profit
2 (a)		1.6	B	1.3a	B1
2 (b)		2.0736	B	1.3a	B1
2 (c)		40	B	1.3a	B1
3 (a)		$4c$	B	1.3a	B1
3 (b)		$30m$	B	1.3a	B1
3 (c)		$9e - 2f$	M A	1.3a 1.3a	M1 for $9e$ or $-2f$ A1
3 (d)		$x^2 + 8x + 15$	M A	1.3a 1.3a	M1 for at least 3 terms out of 4 correct in expansion A1

Question	Working	Answer	Mark type	AO	Notes
4 (a)		2 : 5	M A	1.3a 1.3a	M1 for any correct ratio equivalent to 48 : 120 A1 cao
4 (b)		6	M A	1.3b 1.3b	M1 for starting to list combinations A1 cao
4 (c)		4	P P A	3.1d 3.1d 1.3b	P1 for a correct process to start to solve problem, e.g. 0.3 × 60 P1 for all necessary processes A1 cao
5 (a) (i)		A suitable diagram showing all required information	P C C	2.3b 2.3b 2.3b	P1 for selecting a suitable diagram, e.g. dual bar chart, a pair of pie charts C1 for chart(s) showing all fully correct information. C1 for fully-labelled chart(s)
(ii)		one advantage	C	2.5b	C1 For one advantage, e.g. bars for each size next to each other
5 (b) (i)		86 to 87	P P	3.1c 1.3a	P1 for selecting the appropriate proportion of size large and writing as a fraction P1 for an answer in the range 86 to 87 supported by a complete process, e.g. multiplying their fraction by 240
(b) (ii)		decision and explanation	C	3.4b	C1 for a decision of whether or not the estimate is reliable with a valid explanation (needs both a decision and a valid explanation to gain the mark)
6		show	P P P C	2.2 2.2 2.2 1.1	P1 for a correct start to the chain of reasoning, e.g. find angle *CAB* P1 for a correct process to find angle *CAB* P1 for completion of chain of reasoning with at least one appropriate reason C1 for all other reasons

Question		Working	Answer	Mark type	AO	Notes
7			£458.85 or £454.86	P	3.1d	P1 for a correct process to find number of sachets used in a year, e.g. 5 × 365 (= 1825) or 5 × 366 (= 1830)
				P	3.1d	P1 for a correct process to find the number of packs required, e.g. "1825" ÷ 16 (= 114 or 115) or "1830" ÷ 16 (= 114 or 115)
				P	3.1d	P1 for recognising the need to round up or down to ensure a whole number value £3.99 × 115 (or 114)
				A	1.3b	A1 for £458.85 or £454.86
8	(a)		96 minutes	M	1.3a	M1 for 1.5 × 2.2 (= 3.3)
				P	3.1d	P1 for process to start to find cooking time
				P	3.1d	P1 for full process to find cooking time
				A	1.3b	A1 for 96 minutes or 1 hour 36 minutes
	(b)		No and comment	C	3.4a	C1 for no with valid comment eg his takes 3×2.2×20 + 30 = 162 which is not double 96 (need both the decision and a comment to gain the mark)
9	(a)		term	B	1.1	B1 for a fully correct statement
9	(b)		factor	B	1.1	B1 for a fully correct statement
10			17	P	3.1d	P1 for strategy to start to solve problem, e.g. x, $2x$, $2x + 9$
				P	3.1d	P1 for process to form an equation in x
				P	3.1d	P1 for complete process to find number of apples
				A	1.3b	A1 cao
11	(a)		Explanation	C	2.3b	C1, e.g. No because pie charts show proportions not actual numbers **or** could be that there were more men in the survey than women
11	(b)		Explanation	C	2.5b	C1, e.g. Yes pie charts are useful if you want to show proportion in each category **or** No – if you want to show that more women than men wear helmets, then bar chart or vertical line graph would be more appropriate

Question	Working	Answer	Mark type	AO	Notes
12	$7 + 28 + 22 = 57$	11, 44 and 38	P	3.1b	P1 for a correct process to develop algebraic expressions for each number and set up an inequality, e.g. $x + 4x + 4x - 6 > 57$ or for a correct trial with a prime number
			P	3.1b	P1 for a correct process to solve the inequality, e.g. $x > (57 + 6) \div 9 (= 7)$ or for a correct trial with the prime number as 7 resulting in a sum of 57
			A	1.3b	A1 cao
13	$3x - 3c = 2x + 5$ $x = 3c + 5$	Shown	P P C	2.2 2.2 2.4a	P1 for a process to start a chain of reasoning P1 for a process to isolate terms in x C1 convincing explanation from $x = 3c + 5$
14 (a)		720	P	3.1c	P1 attempt to find the maximum biscuits for one of the ingredients, e.g. $5000 \div 150 (= 33.3..)$ or $2500 \div 75 (= 33.3...)$ or $3000 \div 100 (= 30)$ or $320 \div 10 (= 32)$
			P	3.3	P1 for identifying butter as the limiting factor or $30 \times 24 (= 720)$ seen
			A	1.3b	A1 for 720 cao

Question	Working	Answer	Mark type	AO	Notes
14 (b)		116.25%	M	1.3b	M1 for a correct method of finding either 70% (= 504) or 30% (= 216) of 720
			P	3.1b	P1 for a process to find the cost of "216" at 55p for 4 (= £29.70)
			P	3.1b	P1 for a process to find revenue, e.g. "504" × £0.25 + "£29.70" (= £155.70)
			P	3.1b	P1 for a process to find profit, e.g. "£155.70" – £45 – £27 (= £83.70)
			M	1.3b	M1 for $\dfrac{\text{'83.70'}}{72} \times 100$
			A	1.3b	A1 for 116.25%
15		Demonstration	M	1.1	M1 for using a radius and a half of the radius in the substitution into $A = \pi r^2$ (or choosing 10 and 5 for the respective radii oe)
			P	2.4a	P1 for a process to find the area of a quadrant, e.g. $\frac{1}{4} \times \pi x^2$ or $4 \times \frac{1}{4} \times \pi \left(\frac{x}{2}\right)^2$ (x may be numerical)
			C	2.4a	C1 for concluding the argument by showing that both areas equate to $\frac{\pi x^2}{4}$ (x may be numerical in which case both areas must be shown to be the same multiple of π)
16 (a) (i)		Correct drawing	M	1.3a	M1 for a correct bearing drawn or for a correct distance drawn or quoted
			A	1.3a	A1 for a correct position of B
(a) (ii)		230°	B	1.1	B1 for 230° cao

Question	Working	Answer	Mark type	AO	Notes
16 (b)		Correct statement with evidence	P	2.3a	P1 for drawing a correct right-angle triangle showing line East from A and perpendicular from B (can be implied by correct trigonometric ratio)
			M	1.3b	M1 for cos 50° = $\dfrac{d}{36}$ oe
			P	2.2	P1 for 36 × cos 50° oe
			C	2.1a	C1 for deduction 23.14 km plus a statement saying that the ship is always more than 23 km from the lighthouse
17	$x \div 0.002$ $(x \times 1000) \div 0.02$ (g/m³) $(x \times 1000) \div (0.02 \times 100^3)$	show	M	1.1	M1 for use of density = mass ÷ volume
			M	1.1	M1 for at least one correct unit conversion
			P	2.2	P1 for process to use density and all unit conversions
			P	2.2	P1 for complete chain of reasoning
18		0.58	M	1.3b	M1 for probability that Polly wins both games = 0.6 × 0.7 (= 0.42)
			M	1.3b	M1 for 1 – "0.42"
			A	1.3b	A1 for 0.58 OR M1 for 0.6 × 0.3 (Polly wins at chess and loses at snooker) or 0.4 × 0.7 (Polly does not win at chess but wins at snooker) or 0.4 × 0.3 (Polly does not win either game) M1 for 0.6 × 0.3 + 0.4 × 0.7 + 0.4 × 0.3 A1 for 0.58