N5

National Qualifications
SPECIMEN ONLY

Mark

S844/75/02

Applications of Mathematics Paper 2

Date — Not applicable

Duration — 2 hours

Fill in these boxes and read what is printed below.

Full name of centre

Town

Forename(s)

Surname

Number of seat

Date of birth

Day	Month	Year	Scottish candidate number

Total marks — 65

Attempt ALL questions.

You may use a calculator.

To earn full marks you must show your working in your answers.

State the units for your answer where appropriate.

Write your answers clearly in the spaces provided in this booklet. Additional space for answers is provided at the end of this booklet. If you use this space you must clearly identify the question number you are attempting.

Use **blue** or **black** ink.

Before leaving the examination room you must give this booklet to the Invigilator; if you do not, you may lose all the marks for this paper.
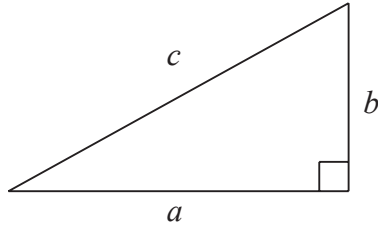
SQA

FORMULAE LIST

Circumference of a circle: $C = \pi d$

Area of a circle: $A = \pi r^2$

Theorem of Pythagoras:

$$a^2 + b^2 = c^2$$

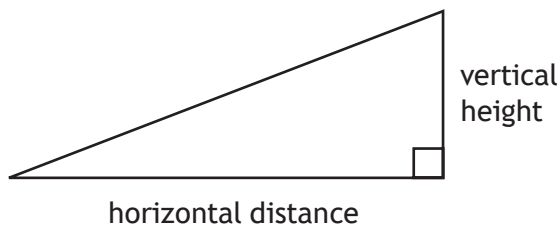Volume of a cylinder: $V = \pi r^2 h$

Volume of a prism: $V = Ah$

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

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

Standard deviation: $s = \sqrt{\dfrac{\Sigma(x - \bar{x})^2}{n-1}} = \sqrt{\dfrac{\Sigma x^2 - (\Sigma x)^2/n}{n-1}}$, where n is the sample size.

Gradient:

$$\text{gradient} = \frac{\text{vertical height}}{\text{horizontal distance}}$$

Total marks — 65

Attempt ALL questions

1. Erin bought a yacht costing £780 000 in February 2013.

For the next three years the value of the yacht decreased by 4·1% per annum.

Calculate the value of the yacht in February 2016.

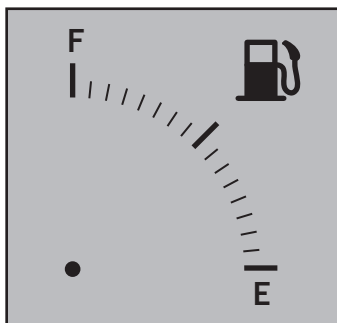Give your answer to **3 significant figures**. **4**

2. The fuel tank in Colin's car holds 64 litres of fuel.

Colin started with a full tank and used 40 litres of fuel.

Mark the amount of fuel **remaining** in the tank on the gauge shown below. **2**

3. An athlete without a coach runs a series of 400 metre races. A sample of his times, in seconds, is shown below.

47·8   48·3   50·2   49·5   46·9   49·5

(a) For these times, calculate:

(i) the mean;   **1**

(ii) the standard deviation.   **3**

(b) The same athlete then decides to train with a coach.

After training with the coach, the athlete runs a series of races which produces a mean of 49·3 seconds and a standard deviation of 0·23.

Make two valid comparisons about the times taken by the athlete before and after training with the coach.   **2**
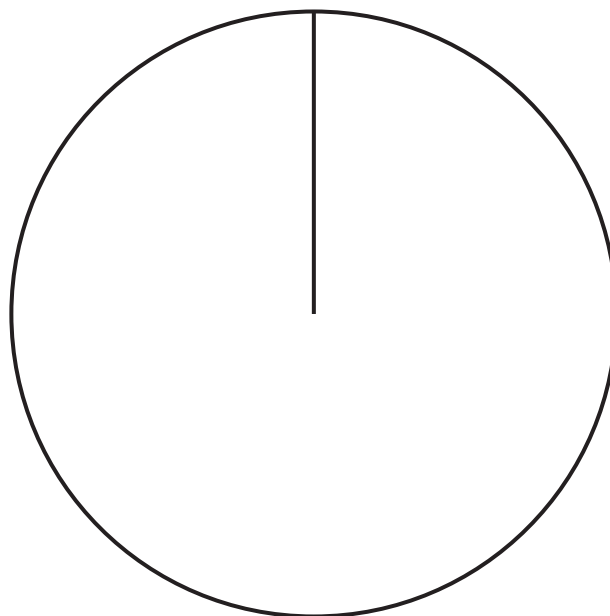
4. A garage sells 150 cars in a month.

The bar chart below shows how many cars of each type are sold.
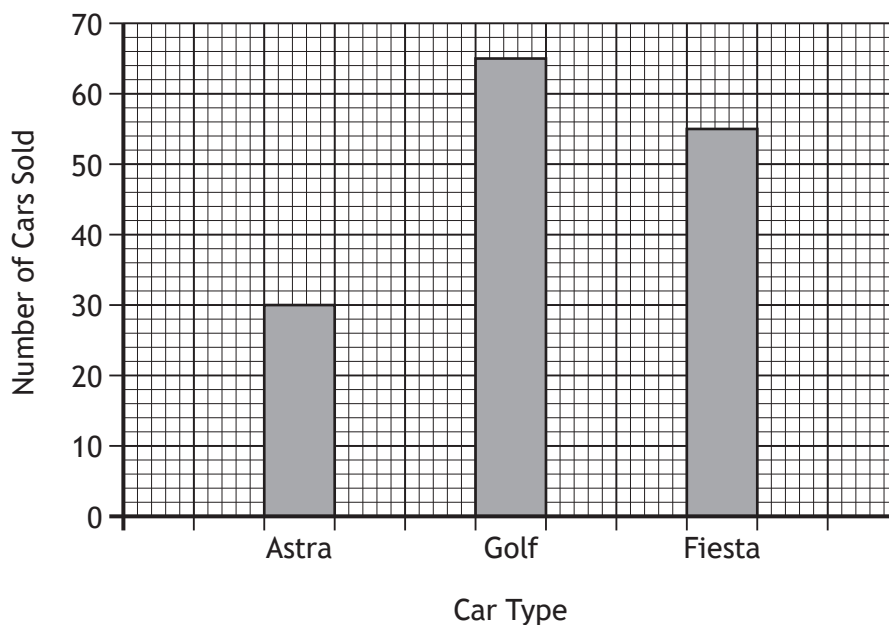
Construct a pie chart to show this information.

3

(An additional diagram, if required, can be found on *page 17*.)

5. Donna makes tartan handbags.

She puts the bags into boxes. The boxes have the dimensions shown below.

42 cm

42 cm

81 cm
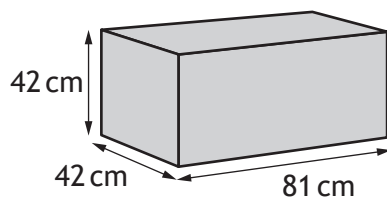
Donna exports her handbags to the USA in a container. The container has the internal dimensions shown below.

2·59 m

2·44 m

6·06 m
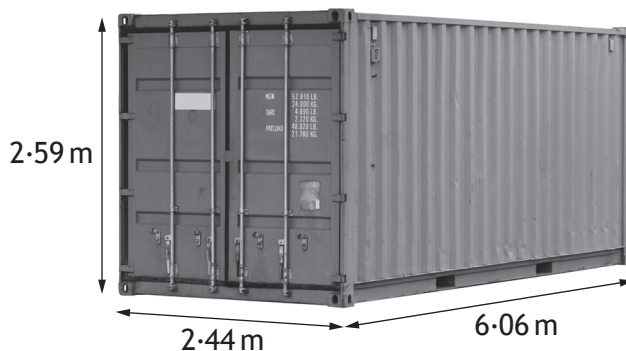
All the boxes must be aligned in the same direction.

(a) Calculate the maximum number of boxes that can fit in the container.

Use your working to justify your answer.   **3**

(b) The rental and shipping of the container costs £1755.

Each box costs £2·99.

Each box holds 4 handbags.

Calculate the cost of shipping per handbag.   **2**

6. Graham earns £49 920 per annum.

National Insurance is calculated on a person's salary **before** deductions such as pension contributions.

National Insurance Rates	
Up to £8060	0%
From £8060 to £42 380	12%
Over £42 380	2%

(a) Calculate Graham's annual National Insurance payment. **3**

(b) Graham pays 9% of his annual salary into his pension.

Graham's annual income tax is £6870·04.

Graham is paid in 12 monthly payments.

Calculate Graham's monthly net pay. **3**

6. (continued)

(c) He wants to buy a new car.

The car loan and running costs would be £460 per month.

He makes a table to show his monthly income and outgoings.

	Income	**Outgoings**
Take home pay		
Rent		£750
Bills		£450
Food		£625
Entertainment		£125
Child care		£350

Will Graham have enough money each month to get this particular car?

Use your working to justify your answer. **2**

7. The boat leaves from the harbour on a bearing of 045° for a distance of 22 miles to Puffin Island.

The boat leaves Puffin Island on a bearing of 170° and travels for a further 37 miles to Gull Isle.

(a) Construct a scale drawing to illustrate this journey.

Use a scale of 1 cm : 5 miles.

(An additional diagram, if required, can be found on *page 18*.)

N

Harbour

The boat continues back to the harbour.

(b) Use the scale drawing to determine the bearing and distance of the harbour from the boat.

7. (continued)

(c) The boat leaves the harbour at 0930.

It stops for 1 hour 15 minutes at Puffin Island and 2 hours 50 minutes at Gull Isle.

The boat arrives back at the harbour at 1800 the same day.

Calculate the average speed of the boat whilst it is moving. **3**

8. Fiona is planning to stay in New York, USA, for three days.
The table shows the attractions Fiona wants to visit and how much they cost.

Attraction	Full price in US Dollars
Empire State Building	$32
Top of the Rock Observation Deck	$30
Statue of Liberty Cruise	$40
9/11 Memorial and Museum	$24
Waxworks	$37
One World Observatory	$32

Fiona plans to buy a discount card to reduce the cost of visiting these attractions.

There are three different discount cards.

Not all of the attractions are included in all of the cards. Fiona must pay full price for these.

Card 1: NY Card

NY Card
Attractions:

★ Sea and Space Museum ★   ★ Top of the Rock Observation Deck ★

★ Museum of Natural History ★   ★ 9/11 Memorial and Museum ★

★ Statue of Liberty Cruise ★   ★ Empire State Building ★

★★★★ Total Cost $114 ★★★★

Benefits:

These six attractions can be visited for a single payment of $114.
This card can only be used once per attraction.
It is valid for 30 days from first use.

Card 2: Explore NY Card

Explore NY Card

Attractions:

9/11 Memorial and Museum • Statue of Liberty Cruise
Museum of Natural History • Sea and Space Museum
Empire State Building • Top of the Rock Observation Deck
Waxworks • Carnegie Hall • Rockefeller Centre Tour

Cost for any 3 attractions $71

Benefits:

This card can be used for any 3 attractions from the list.
This card can only be used once per attraction.
It is valid for 30 days from first use.

8. (continued)

Card 3: NY Town Pass

NY Town Pass

80+ attractions are included for one price.
The card is valid for 1, 2, 3 or 5 days.

Cost

$90   1 day pass $180   3 day pass
$140   2 day pass $190   5 day pass

Benefits:

    All of Fiona's chosen attractions can be visited with this card.

(a)   During her three-day visit, Fiona will visit two attractions each day.

    Fiona is going to buy one discount card.

    (i)   Calculate the total cost of all six attractions if Fiona buys Card 1.   **2**

    (ii)   Calculate the cheapest price that Fiona could pay for entry to her six chosen attractions.   **4**

(b)   Fiona pays the cheapest price for entry to her six chosen attractions.

    She pays before leaving the UK.

    The cost is £100·96.

    Calculate the exchange rate that Fiona received.

    Give your answer correct to **3 decimal places**.   **2**

9. A garden in the shape of a **right-angled triangle** has a semi-circular pond on the hypotenuse as shown below.
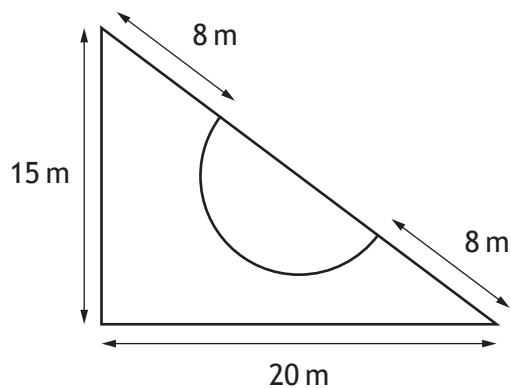
(a) Calculate the diameter of the pond. **2**

(b) The garden, excluding the pond, is to be covered with stone chips.

Calculate the area to be covered with stone chips. **3**

(c) The stone chips come in 25 kg bags costing £2·59 each.

1000 kg of chips covers an area of 20 m^2.

Calculate the cost of the stone chips for the garden. **3**

10. Brendan makes candles from blocks of wax.

Each block of wax is a cuboid measuring 30 cm by 20 cm by 20 cm as shown.
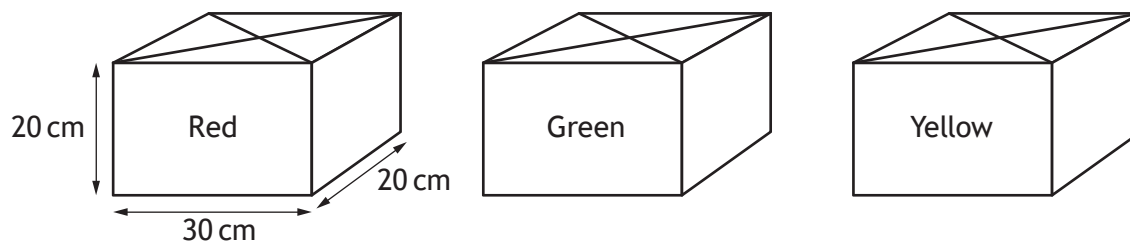
Each candle contains the colours red, green and yellow in the ratio 3 : 1 : 2 respectively.

Each candle is a cube with volume 729 cm^3.

(a) Brendan only has 1 block of each colour.

What is the maximum number of candles that he can make? **3**

(b) Brendan makes the maximum number of candles.

Any wax that is left over is thrown away.

Each block of wax costs £13·75.

Brendan also buys wicks which cost 18p per candle.

Brendan adds 65% to his costs when calculating the selling price of each candle.

What is Brendan's selling price for each candle? **3**

10. (continued)

Brendan also makes blue candles in the shape of a cylinder with a cone on top as shown.

height of candle 16 cm

height of cylinder 12 cm

diameter 7 cm
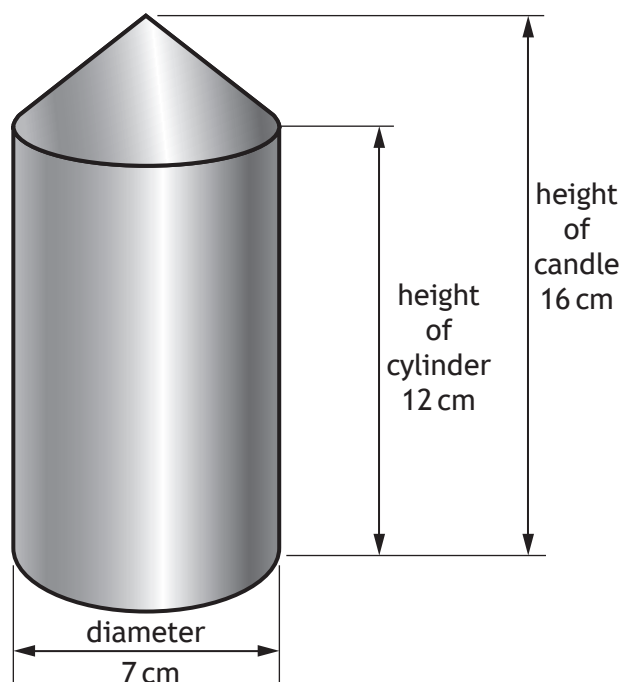
(c) He buys blue wax in blocks with volume $12\,000\,cm^3$.

Brendan thinks that he can make 25 of these candles from one block of wax.

Is he correct?

Use your working to justify your answer.   **7**

[END OF SPECIMEN QUESTION PAPER]

ADDITIONAL SPACE FOR ANSWERS

Additional diagram for Question 4

ADDITIONAL SPACE FOR ANSWERS

Additional diagram for Question 7 (a)

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Harbour

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N5

National
Qualifications
SPECIMEN ONLY

S844/75/02

Applications of Mathematics
Paper 2

Marking Instructions

SQA

General marking principles for National 5 Applications of Mathematics

This information is provided to help you understand the general principles you must apply when marking candidate respon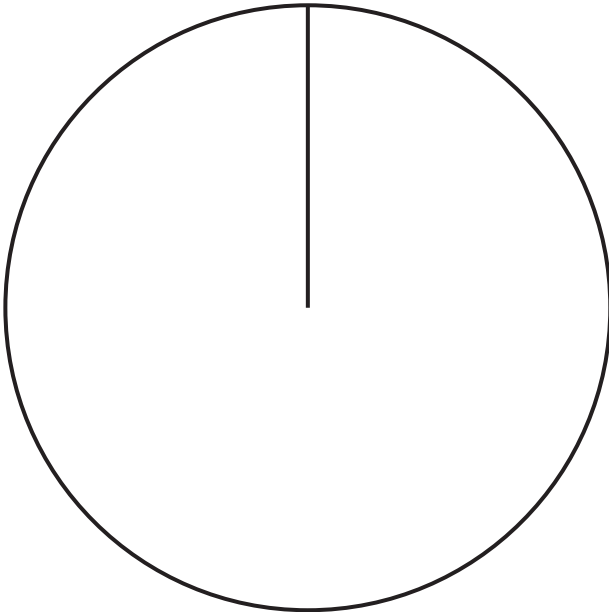ses to questions in this paper. These principles must be read in conjunction with the detailed marking instructions, which identify the key features required in candidate responses.

For each question the marking instructions are generally in two sections, namely generic scheme and illustrative scheme. The generic scheme indicates the rationale for which each mark is awarded. The illustrative scheme covers methods which are commonly seen throughout the marking. In general, markers should use the illustrative scheme and only use the generic scheme where a candidate has used a method not covered in the illustrative scheme.

(a) Marks for each candidate response must <u>always</u> be assigned in line with these general marking principles and the detailed marking instructions for this assessment.

(b) Marking should always be positive. This means that, for each candidate response, marks are accumulated for the demonstration of relevant skills, knowledge and understanding: they are not deducted from a maximum on the basis of errors or omissions.

(c) If a specific candidate response does not seem to be covered by either the principles or detailed marking instructions, and you are uncertain how to assess it, you must seek guidance from your team leader.

(d) Credit must be assigned in accordance with the specific assessment guidelines.

(e) One mark is available for each •. There are no half marks.

(f) Working subsequent to an error must be **followed through**, with possible credit for the subsequent working, provided that the level of difficulty involved is approximately similar. Where, subsequent to an error, the working for a follow through mark has been eased, the follow through mark cannot be awarded.

(g) As indicated on the front of the question paper, full credit should only be given where the solution contains appropriate working. Unless specifically mentioned in the marking instructions, a correct answer with no working receives no credit.

(h) Candidates may use any mathematically correct method to answer questions except in cases where a particular method is specified or excluded.

(i) As a consequence of an error perceived to be trivial, casual or insignificant, eg $6 \times 6 = 12$ candidates lose the opportunity of gaining a mark. However, note the second example in comment **(j)**.

(j) Where a transcription error (paper to script or within script) occurs, the candidate should normally lose the opportunity to be awarded the next process mark, eg

> This is a transcription error and so the mark is not awarded.

> Eased as no longer a solution of a quadratic equation so mark is not awarded.

> Exceptionally this error is not treated as a transcription error as the candidate deals with the intended quadratic equation. The candidate has been given the benefit of the doubt and all marks awarded.

$$x^2 + 5x + 7 = 9x + 4$$
$$x - 4x + 3 = 0$$
$$x = 1$$

$$x^2 + 5x + 7 = 9x + 4$$
$$x - 4x + 3 = 0$$
$$(x - 3)(x - 1) = 0$$
$$x = 1 \text{ or } 3$$

(k) **Horizontal/vertical marking**
Where a question results in two pairs of solutions, this technique should be applied, but only if indicated in the detailed marking instructions for the question.

Example:

$$\begin{array}{cc} \bullet^5 & \bullet^6 \\ \bullet^5 \quad x = 2 & x = -4 \\ \bullet^6 \quad y = 5 & y = -7 \end{array}$$

Horizontal: $\bullet^5$ $x = 2$ and $x = -4$ Vertical: $\bullet^5$ $x = 2$ and $y = 5$
             $\bullet^6$ $y = 5$ and $y = -7$ $\bullet^6$ $x = -4$ and $y = -7$

Markers should choose whichever method benefits the candidate, but **not** a combination of both.

(l) In final answers, unless specifically mentioned in the detailed marking instructions, numerical values should be simplified as far as possible, eg:

$\dfrac{15}{12}$ must be simplified to $\dfrac{5}{4}$ or $1\dfrac{1}{4}$ $\dfrac{43}{1}$ must be simplified to 43

$\dfrac{15}{0\cdot3}$ must be simplified to 50 $\dfrac{4/5}{3}$ must be simplified to $\dfrac{4}{15}$

$\sqrt{64}$ must be simplified to 8*****

*The square root of perfect squares up to and including 100 must be known.

(m) Unless specifically mentioned in the marking instructions, the following should not be penalised:

- Working subsequent to a correct answer
- Correct working in the wrong part of a question
- Legitimate variations in numerical answers/algebraic expressions, eg angles in degrees rounded to nearest degree
- Omission of units
- Bad form (bad form only becomes bad form if subsequent working is correct), eg $(x^3+2x^2+3x+2)(2x+1)$ written as $(x^3+2x^2+3x+2)\times 2x+1$

  $2x^4+4x^3+6x^2+4x+x^3+2x^2+3x+2$ written as $2x^4+5x^3+8x^2+7x+2$ gains full credit

- Repeated error within a question, but not between questions or papers

(n) In any 'Show that…' question, where the candidate has to arrive at a required result, the last mark of that part is not available as a follow-through from a previous error unless specified in the detailed marking instructions.

(o) All working should be carefully checked, even where a fundamental misunderstanding is apparent early in the candidate's response. Marks may still be available later in the question so reference must be made continually to the marking instructions. The appearance of the correct answer does not necessarily indicate that the candidate has gained all the available marks.

(p) Scored-out working which has not been replaced should be marked where still legible. However, if the scored out working has been replaced, only the work which has not been scored out should be marked.

(q) Where a candidate has made multiple attempts using the same strategy and not identified their final answer, mark all attempts and award the lowest mark.

Where a candidate has tried different valid strategies, apply the above ruling to attempts within each strategy and then award the highest resultant mark.

For example:

Strategy 1 attempt 1 is worth 3 marks.	Strategy 2 attempt 1 is worth 1 mark.
Strategy 1 attempt 2 is worth 4 marks.	Strategy 2 attempt 2 is worth 5 marks.
From the attempts using strategy 1, the resultant mark would be 3.	From the attempts using strategy 2, the resultant mark would be 1.

In this case, award 3 marks.

Marking instructions for each question

Question	Generic scheme	Illustrative scheme	Max mark
1	**Ans: (£)688 000** •¹ Strategy: identify multiplier •² Strategy: identify power •³ Process: calculate value •⁴ Communication: round answer to 3 significant figures	•¹ 0·959 •² …³ •³ 687939·7816 •⁴ 688 000	**4**
2	**Ans: Correct amount marked on gauge** •¹ Process: calculate amount of fuel remaining, as a fraction •² Communication: mark on gauge consistent with working	•¹ 24/64 or equivalent •² Evidence	**2**

Question			Generic scheme	Illustrative scheme	Max mark
3	(a)	(i)	**Ans: ($\overline{x}$ =) 48·7** •¹ Process: calculate mean	•¹ ($\overline{x}$ =) 48·7	**1**
		(ii)	**Ans: (*s* =) 1·24** •² Process: calculate $(x - \overline{x})^2$ •³ Strategy: substitute into formula •⁴ Process: calculate standard deviation	•² 0·81, 0·16, 2·25, 0·64, 3·24, 0·64 •₃ $\sqrt{\dfrac{7 \cdot 74}{5}}$ •⁴ (*s* =) 1·24	
	(b)		**Ans: Two valid comments.** •¹ Communication: comment regarding the mean •² Communication: comment regarding standard deviation	•¹ On average, the athlete's times have increased training with the coach. •² The athlete's times are more consistent after training with the coach.	**2**
4			**Ans: Pie chart constructed** •¹ Strategy/process: interpret graph and state fraction for each type of car •² Process: calculate angles •³ Process/communication: construct pie chart	•¹ $\dfrac{30}{150}, \dfrac{65}{150}, \dfrac{55}{150}$ or equivalent •² 72°, 156°, 132° •³ Pie chart completed with labels	**3**

	Question		Generic scheme	Illustrative scheme	Max mark
5	(a)		**Ans: 252 (boxes)**		**3**
			$\bullet^1$ Strategy: consider three options	$\bullet^1$ evidence	
			$\bullet^2$ Process: find number of boxes for one option	$\bullet^2$ 210 or 210 or 252	
			$\bullet^3$ Process/communication: find at least one other option and state maximum	$\bullet^3$ 252	
	(b)		**Ans: £2·49**		**2**
			$\bullet^1$ Process: calculate total cost of sending boxes	$\bullet^1$ £1755 + 252 × £2·99 = £2508·48	
			$\bullet^2$ Process: calculate cost per handbag	$\bullet^2$ £2508·48 ÷ 252 ÷ 4 = £2·49	

Question			Generic scheme	Illustrative scheme	Max mark
6	(a)		**Ans: (£)4269·20** $\bullet^1$ Process: calculate first rate National Insurance $\bullet^2$ Process: calculate second rate National Insurance $\bullet^3$ Process: calculate annual National Insurance contributions	$\bullet^1$ $0·12 \times (42380 - 8060) = 4118·40$ $\bullet^2$ $0·02 \times (49920 - 42380) = 150·80$ $\bullet^3$ $4118·40 + 150·80 = 4269·20$	3
	(b)		**Ans: (£)2857·33** $\bullet^1$ Process: calculate pension contribution $\bullet^2$ Process: calculate annual net salary $\bullet^3$ Process: calculate monthly net pay	$\bullet^1$ $0·09 \times 49920 = 4492·80$ $\bullet^2$ $49920 - (4492·80 + 4269·20 + 6870·04) = 34287·96$ $\bullet^3$ $(34287·96 \div 12) = 2857·33$	3
	(c)		**Ans: He will have enough.** $\bullet^1$ Process: calculate surplus/deficit $\bullet^2$ Communication: make conclusion	$\bullet^1$ $2857·33 - (750 + 450 + 625 + 125 + 350) = 557·33$ $\bullet^2$ Yes. He will have enough.	2

Question			Generic scheme	Illustrative scheme	Max mark
7	(a)		**Ans: Route correctly drawn**		**3**
			$\bullet^1$ Process: calculate scale distances	$\bullet^1$ $22 \div 5 = 4 \cdot 4$ cm $37 \div 5 = 7 \cdot 4$ cm	
			$\bullet^2$ Process/communication: correct bearing measured and correct length drawn	$\bullet^2$ Bearing of $045°(\pm1°)$ measured correctly and $4 \cdot 4$ cm$(\pm0 \cdot 1$ cm$)$ correctly drawn	
			$\bullet^3$ Process/communication: correct bearing measured and correct length drawn	$\bullet^3$ Bearing of $170°(\pm1°)$ measured correctly	
	(b)		**Ans: 314 (°)**		**2**
			$\bullet^1$ Process: bearing consistent with diagram	$\bullet^1$ 314	
			Ans: 30·5(miles)		
			$\bullet^2$ Process: distance consistent with diagram	$\bullet^2$ $6 \cdot 1$ cm so $30 \cdot 5$ miles	
	(c)		**Ans: 20·26 mph**		**3**
			$\bullet^1$ Process: calculate total distance	$\bullet^1$ $30 \cdot 5 + 22 + 37 = 89 \cdot 5$	
			$\bullet^2$ Process: calculate decimal time	$\bullet^2$ 8 hour 30 min $-$ 4 hour 5 min = 4 hour 25 min $4\dfrac{25}{60} = 4 \cdot 416\ldots$	
			$\bullet^3$ Process: calculate average speed	$\bullet^3$ $\dfrac{89 \cdot 5}{4 \cdot 416\ldots} = 20 \cdot 264\ldots$	

Question			Generic scheme	Illustrative scheme	Max mark
8	(a)	(i)	**Ans: $183**		2
			$\bullet^1$ Strategy: identify the costs not included	$\bullet^1$ $32 and $37	
			$\bullet^2$ Process: calculate the cost for card 1	$\bullet^2$ $114 + 32 + 37 = $183	
		(ii)	**Ans: $157 supported by working**		4
			$\bullet^3$ Strategy: identify the "missing" attraction and the two cheapest attractions	$\bullet^3$ $24, $32 and $30	
			$\bullet^4$ Process: calculate the cost for card 2	$\bullet^4$ $71 + $24 + $32 + $30 = $157	
			$\bullet^5$ Process: state cost of card 3	$\bullet^5$ $180	
			$\bullet^6$ Communication: state the cheapest price	$\bullet^6$ $157	
	(b)		**Ans: £1 gives $1·555 or $1 gives £0·643**		2
			$\bullet^1$ Strategy: evidence of knowing to divide	$\bullet^1$ 157 ÷ 100·96 or 100·96 ÷ 157	
			$\bullet^2$ Process: state rounded answer	$\bullet^2$ £1 gives $1·555 or $1 gives £0·643	

Question			Generic scheme	Illustrative scheme	Max mark
9	(a)		**Ans: 9(m)**		2
			$\bullet^1$ Strategy/process: use Pythagoras Theorem to calculate hypotenuse	$\bullet^1$ 25	
			$\bullet^2$ Process: calculate diameter	$\bullet^2$ $25 - 16 = 9$	
	(b)		**Ans: 118·2(m²)**		3
			$\bullet^1$ Strategy: triangle – semi circle	$\bullet^1$ evidence	
			$\bullet^2$ Process: find the area of the pond	$\bullet^2$ $\frac{1}{2} \times \pi \times 4 \cdot 5^2 = 31 \cdot 808\ldots$	
			$\bullet^3$ Process: calculate the area to be covered with chips	$\bullet^3$ $150 - 31 \cdot 808\ldots = 118 \cdot 191\ldots$	
	(c)		**Ans: (£)613·83**		3
			$\bullet^1$ Process: Calculate weight of chips required	$\bullet^1$ $118 \cdot 2 \div 20 \times 1000 = 5910$	
			$\bullet^2$ Process: Calculate number of bags required	$\bullet^2$ $5910 \div 25 = 236 \cdot 4$, 237 bags	
			$\bullet^3$ Process: Calculate cost	$\bullet^3$ $237 \times 2 \cdot 59 = 613 \cdot 83$	

Question			Generic scheme	Illustrative scheme	Max mark
10	(a)		**Ans: 32 candles**		**3**
			$\bullet^1$ Strategy: know how to use ratio	$\bullet^1$ evidence of knowing how to scale up the ratio	
			$\bullet^2$ Process: find total amount of wax used	$\bullet^2$ $12000 + 4000 + 8000 =$ $24000\, cm^3$	
			$\bullet^3$ Process: find number of candles	$\bullet^3$ $24000 \div 729 = 32 \cdot 92\ldots = 32$	
			Alternative Strategy:		
			$\bullet^1$ Strategy: know how to use ratio	$\bullet^1$ evidence of 3/6 of 729	
			$\bullet^2$ Process: finds volume of red wax available and volume of red wax in candle	$\bullet^2$ $12000\, cm^3$ and $364 \cdot 5$	
			$\bullet^3$ Process: find number of candles	$\bullet^3$ $12000 \div 364 \cdot 5 = 32 \cdot 92$ rounded to 32	
	(b)		**Ans: (£)2·43/2·42**		**3**
			$\bullet^1$ Process: find cost of wax plus wicks	$\bullet^1$ $3 \times 13 \cdot 75 + 32 \times 0 \cdot 18 = 47 \cdot 01$	
			$\bullet^2$ Process: add 65%	$\bullet^2$ $47 \cdot 01 \times 1 \cdot 65 = 77 \cdot 57$	
			$\bullet^3$ Process: find selling price of 1 candle	$\bullet^3$ $77 \cdot 57 \div 32 = 2 \cdot 424\ldots = 2 \cdot 43$	

Question			Generic scheme	Illustrative scheme	Max mark
	(c)		**Ans: no supported by working**		7
			$\bullet^1$ Strategy: knows how to find compound volume	$\bullet^1$ evidence	
			$\bullet^2$ Strategy: substitute into cylinder formula	$\bullet^2$ $V = \pi \times 3{\cdot}5 \times 3{\cdot}5 \times 12$	
			$\bullet^3$ Process: find volume of cylinder	$\bullet^3$ 461·8 (or 461·58)	
			$\bullet^4$ Strategy: substitute into cone formula	$\bullet^4$ $V = \dfrac{1}{3}\pi \times 3{\cdot}5 \times 3{\cdot}5 \times 4$	
			$\bullet^5$ Process: find volume of cone	$\bullet^5$ 51·3	
			$\bullet^6$ Process: find the number of candles that can be made	$\bullet^6$ $461{\cdot}8 + 51{\cdot}3 = 513{\cdot}1$, $12000 \div 513{\cdot}1 = 23{\cdot}38$	
			$\bullet^7$ Communication: valid conclusion	$\bullet^7$ no he can't make 25 candles	

[END OF SPECIMEN MARKING INSTRUCTIONS]