FOR OFFICIAL USE

N5

National Qualifications SPECIMEN ONLY

Mark

SQ26/N5/02

Lifeskills Mathematics Paper 2

Date — Not applicable

Duration — 1 hour and 40 minutes

SQ26N502

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
DD	MM	YY

Scottish candidate number

Total marks — 55

You may use a calculator.

Attempt ALL questions.

Use **blue** or **black** ink. Pencil may be used for graphs and diagrams only.

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

Square-ruled paper is provided at the back of this booklet.

Full credit will be given only to solutions which contain appropriate working.

State the units for your answer where appropriate.

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.

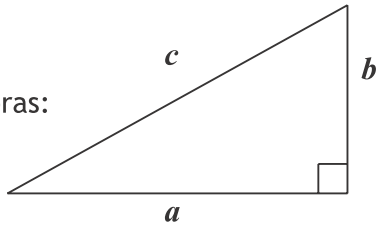
SQA ©

FORMULAE LIST

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

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

Theorem of Pythagoras:



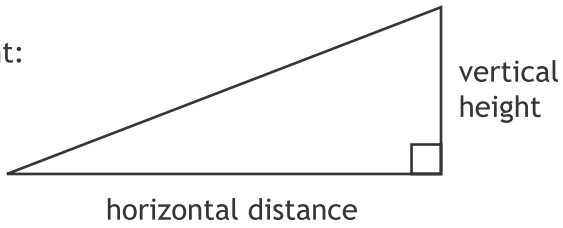
$a^2 + b^2 = c^2$

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

Volume of a prism: $V = Ah$

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

Gradient:



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

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Attempt ALL questions

1. A triathlon is a competition involving swimming, cycling and running.

It has 3 stages. Competitors aim to complete each stage within the target time.

The table below shows information about different triathlon events.

Name of triathlon event			
	Stage 1	**Stage 2**	**Stage 3**
Super Sprint	Swim 400 m Target time: 8 mins	Cycle 10 km Target time: 18 mins	Run 2·5 km Target time: 10 mins
Sprint	Swim 750 m Target time: 11 mins	Cycle 20 km Target time: 30 mins	Run 5 km Target time: 17 mins
Olympic	Swim 1500 m Target time: 23 mins	Cycle 40 km Target time: 60 mins	Run 10 km Target time: 35 mins

(a) What is the total distance (in kilometres) for the **Sprint** event? **1**

(b) If the **Olympic** swim is completed **exactly** on the target time, what would be the average speed in metres per minute? **2**

Question 1 (continued)

(c) If Joe completed Stage 2 of the **Super Sprint** event at an average speed of 25 kilometres per hour, was he within the target time?

Give a reason for your answer. **2**

Total marks 5

MARKS DO NOT WRITE IN THIS MARGIN

2. To use a Fun Park you can either buy:

- unlimited ride wristbands or
- a Fun Park Pass and single tokens.

The prices are given below.

Price list	
Individual unlimited ride wristband	£35·00
Family of four unlimited ride wristband	£91·00
Fun Park Pass per person	£5·00
Single tokens (each)	£1·00

Ride	Number of tokens required
Ghost Train	3
Dodgems	3
Zero Gravity	6
Flying Rockets	3
White Water Ride	3
Big Splash Mountain	3

The Oliver family consists of 2 adults and 2 children.

(a) Calculate how much it would cost the Oliver family to buy Fun Park Passes and enough single tokens for each of them to go once on the Ghost Train, Dodgems and Zero Gravity. **2**

Question 2 (continued)

(b) The Oliver family thinks that buying Fun Park passes and single tokens is the cheapest way to go on these 3 rides.

Is the Oliver family correct? Use your working to justify your answer. **2**

(c) The Oliver family wants to return next week to go on **ALL** of the rides once. What will be the cheapest way for them to do this? Show your working. **4**

Total marks 8

3.

Maxisport/Shutterstock.com

An athlete **without a coach** records the following times (in seconds) in a series of 400 metre races.

47·8 48·3 50·2 49·5 46·9 49·5

The same athlete then decides to train with an athletics 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.

(a) For the athlete's times **without a coach**, calculate:

(i) the mean; **1**

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

(b) Make **two** valid comparisons about the performance of the athlete before and after training with the coach. **2**

Question 3 (continued)

(c) In the final of the 400 metres sprint at the athletics championship, the following times were recorded, in seconds.

47·8 47·9 54·8 48·1 48·3 47·1

Calculate:

(i) the mean; **1**

(ii) the median. **1**

(d) Which of the two averages — the mean or the median — is more representative of the data?

Give a reason for your answer. **1**

Total marks 9

4. Orla and Mark want a new kitchen.

They investigate various options to borrow the money they need and to pay it back **in one year**. The following information is what they found out.

The best rates for fixed amounts are from EasyBank as shown in the table below.

Loan Amount	£2500		£5000		£10 000	
Interest per year	17%		14·6%		12·26%	
Repayment terms over 1 year	Monthly	Total	Monthly	Total	Monthly	Total
	£243·75	**A**	£477·50	£5730	**B**	£11 226

(a) What is the total repayment **(A)** on a loan of £2500 from EasyBank? **1**

(b) What is the monthly repayment **(B)** on a loan of £10 000 from EasyBank? **1**

(c) Calculate the difference in total repayments between Orla and Mark taking out a loan of £5000 each, compared with a single loan of £10 000 from EasyBank. **2**

(d) Orla and Mark also consider using a home improvement loan from a finance company to buy a kitchen. The finance company charges 27·5% simple interest on the loan amount. Calculate the total amount to be repaid for a loan of £5000. **2**

Question 4 (continued)

(e) Calculate the difference between the total amount to be repaid on a £5000 loan from EasyBank, compared with the total amount to be repaid using the home improvement loan. **1**

(f) Orla and Mark also consider using a store card to buy a kitchen. The kitchen costs £5000. The store card offers a 10% discount on the price of the kitchen. It then charges simple interest of 19·9% on the balance.

Compare the option of using the store card with the option of taking out a loan of £5000 from EasyBank for a year.

Would the store card be a good option? Use your calculations to justify your answer. **4**

Total marks 11

MARKS DO NOT WRITE IN THIS MARGIN

5. For an end-of-term party, the teacher brought in a 2 litre bottle of **undiluted** orange juice.

The 2 litre bottle of undiluted orange juice has to be mixed with 4 times the amount of water.

The teacher **diluted** the orange juice and then poured it into cylindrical glasses with a radius of 4 cm and a height of 10 cm.

(a) If a space of 1 cm is left at the top of each glass, how many pupils will be able to get a glass of orange juice? **5**

(b) If all of the diluted orange juice is poured into 25 of these cylindrical glasses so that each contains the same amount, what depth of orange juice will be in glass?

Write your answer to the nearest centimetre. **4**

Total marks 9

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6. Isaac lives in Edinburgh. He is planning a trip to Europe.

He has saved £1800 for his expenses, travel and accommodation.

He intends to:

- stay 1 night in London on his way to Europe, 12 nights in Berlin, 10 nights in Zurich and 1 night in London on the way home;
- travel by train;
- budget £30 per night for expenses in London, £38 per night in Berlin and £45 per night in Zurich.

He gets the following information from the internet.

London accommodation	Price per night
James Square Hostel	£9
St Ethins Hotel	£49
City Sights Hotel	£41

Berlin accommodation	Price per night
Budget Hostel	€53
One45° Hostel	€13
Astel Haus Hostel	€15

Zurich accommodation	Price per night
Zurich Hostel	CHF 51
Swiss Youth Hostel	CHF 118
Hotel Hattingon	CHF 125
Martha Bed and Breakfast	CHF 113

Question 6 (continued)

TRAIN TIMES and PRICES		
Route	**Departure/Arrival Times**	**Price (GBP) one way**
Edinburgh — London	dep 0800 — arr 1246	60·50
	dep 0830 — arr 1254	73·50
London — Berlin	dep 0835 — arr 2125	112·00
	dep 1504 — arr 0112	39·00
Berlin — Zurich	dep 0948 — arr 1128	56·00
	dep 1141 — arr 1800	103·00
Zurich — London	dep 0934 — arr 1639	188·50
London — Edinburgh	dep 0930 — arr 1415	69·00
	dep 1000 — arr 1524	87·00

FOREIGN EXCHANGE RATES	
POUNDS STERLING (£)	**OTHER CURRENCIES**
1	€1·28 (Euros)
1	CHF 1·53 (Swiss Francs)

(a) Isaac decides to choose the **cheapest** accommodation for his trip. Calculate the **total** cost of his accommodation. Use the foreign exchange information above to give your answer in pounds sterling. **6**

Question 6 (continued)

(b) Isaac also chooses the **cheapest** train journey for each stage of his trip. Find the **total** cost of the train journeys. **2**

(c) Does Isaac have enough money, within his £1800 budget, to pay for his chosen accommodation, train journeys and expenses? Use your calculations to justify your answer. **5**

Total marks 13

[END OF SPECIMEN QUESTION PAPER]

ADDITIONAL SPACE FOR ANSWERS

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DO NOT WRITE IN THIS MARGIN