FOR OFFICIAL USE

National Qualifications 2025

Mark

X844/76/01 Applications of Mathematics

FRIDAY, 16 MAY

9:30 AM – 11:35 AM

X8447601

Fill in these boxes and read what is printed below.

Full name of centre: WORKED SOLUTIONS.

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.

You should refer to the pre-release material for Higher Applications of Mathematics which you can access electronically.

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.

Questions 5, 8 and 12 must be completed on software and then be printed.

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

Before leaving the examination room you must place this booklet and your printouts inside the clear envelope provided. You must give this envelope to the Invigilator; if you do not, you may lose all the marks for this paper.

SQA ©

X8447601

Information and instructions for candidates

The electronic files listed below are provided for you to use during this examination:

- **'Q5 Radio.csv'** — a spreadsheet file containing a data set
- **'Q5 Radio Answers.docx'** — a word processing file. Your output from the statistical software in questions 5 (a) (i) and (a) (iii) must be copied and pasted into this file for printing.
- **'Q8 Finance.xlsx'** — a spreadsheet containing 2 worksheets
- **'Q12 Eye Colour.xlsx'** — a spreadsheet file containing 1 worksheet

You must display your name, SCN and centre name on all pages on each printout. Spaces have been provided in each electronic file for you to complete this information.

When printing spreadsheet files, ensure that:

- landscape orientation is used
- grid lines are shown
- row and column headings are shown
- the option 'Fit All Columns on One Page' is selected.

When printing word processing files ensure that portrait orientation is used.

Use this table to make sure you have all the printouts required.

Question	Printout	Completed (✓)
5 (all parts)	'Q5 Radio Answers.docx' This should include your statistical software output and answers.	✓
8 (a)	'Car Finance' worksheet • value view • formula view	✓ ✓
8 (c)	'Savings' worksheet • value view • formula view	✓ ✓
12 (all parts)	'Eye Colour' worksheet • value view • formula view	✓ ✓

MARKS | DO NOT WRITE IN THIS MARGIN

Total marks — 65

Attempt ALL questions

1. Estimate the total number of portions of fruit and vegetables that a typical person eats during their childhood.

State any assumptions you make. **3**

Assumptions:

Children don't eat 5 portions of fruit per day.
Expected that they will eat 5 portions fruit + veg.
Childhood 12 years, pre-teen.

Calculations:

Total number of portions = $5 \times 365 \times 12$

$= 21,900$ portions.

[Turn over

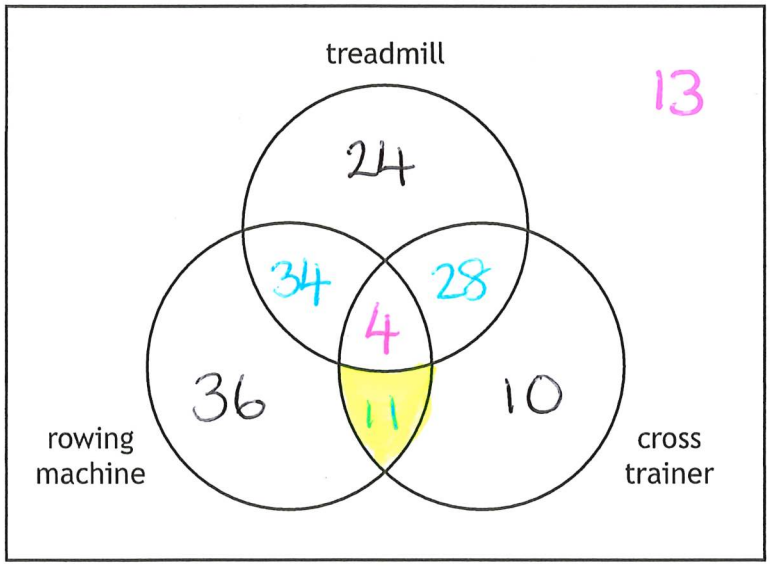
2. A group of gym members were asked what machines they regularly use from a choice of treadmill, rowing machine and cross trainer.

The results were as follows:

- 4 members use all three machines ✓
- 38 members use both the treadmill and the rowing machine ✓ $38-4=34$
- 32 members use both the cross trainer and the treadmill ✓ $32-4=28$
- 15 members use both the rowing machine and the cross trainer ✓ $15-4=11$
- 90 members use the treadmill ✓ $90-(34+4+28)=24$
- 85 members use the rowing machine ✓ $85-(34+4+11)=36$
- 53 members use the cross trainer ✓ $53-(28+4+11)=10$
- 13 members use none of these machines ✓

(a) Complete the Venn diagram to show this information. **3**

(An additional diagram, if required, can be found on *page 21*.)



(b) A gym member is selected at random.

Determine the probability that they regularly use the rowing machine and the cross trainer, but not the treadmill. **2**

Total no of members $= 4+34+28+11+24+10+36=160$

Probability $= \frac{11}{160}$

MARKS | DO NOT WRITE IN THIS MARGIN

3. You must refer to the information on 'Deductions from salaries' given in the pre-release material when answering this question.

Alaina earns a gross annual salary of £24,960. She pays 8.2% of her gross annual salary into her pension and pays £82.56 National Insurance per month.

Calculate her **net monthly salary** after all deductions. 4

Pension contribution = 8.2% of £24960 = £2046.72

Taxable Income = 24960 − 2046.72 = £22913.28

£22913.28		
12570	2306	8037.28
0%	19%	20%

14876 − 12570 = 2306

22913.28 − 14876 = 8037.28

Band	Rate	Value	Income Tax
Pers. All.	0%	12570	0
Starter	19%	2306	£438.14
Basic	20%	8037.28	£1607.46
		£22913.28	£2045.60

Annual NI contributions = £82.56 × 12 = £990.72

Total Annual deductions = 2046.72 + 2045.60 + 990.72

= £5083.04

Net Annual Salary = 24960 − 5083.04

= £19876.96

Net Monthly Salary = £1656.41

DO NOT WRITE IN THIS MARGIN

4. A company makes hand-made teddy bears.

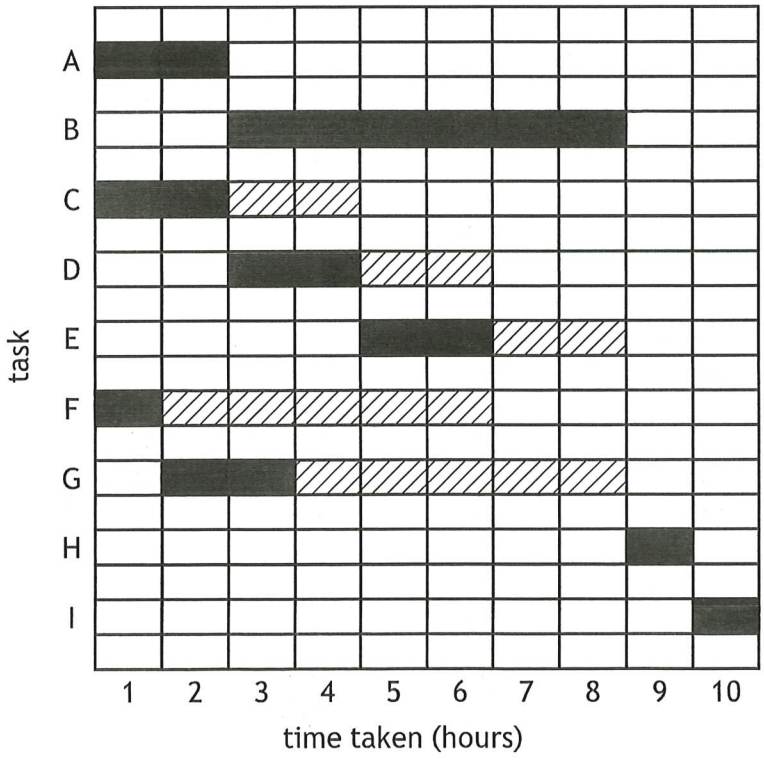
The tasks required to make each teddy bear are listed below.

	Task
A	Cut fur
B	Stuff and sew fur
C	Cut material
D	Sew clothes
E	Embroider t-shirt
F	Cut accessories
G	Sew accessories
H	Dress and accessorise
I	Package and ship bear

The Gantt chart shows the tasks, with float times, when three employees are available to make each teddy bear.

Each task is completed by a **single** employee.

Teddy bear manufacturing process



Float times in the Gantt chart are represented by ▨.

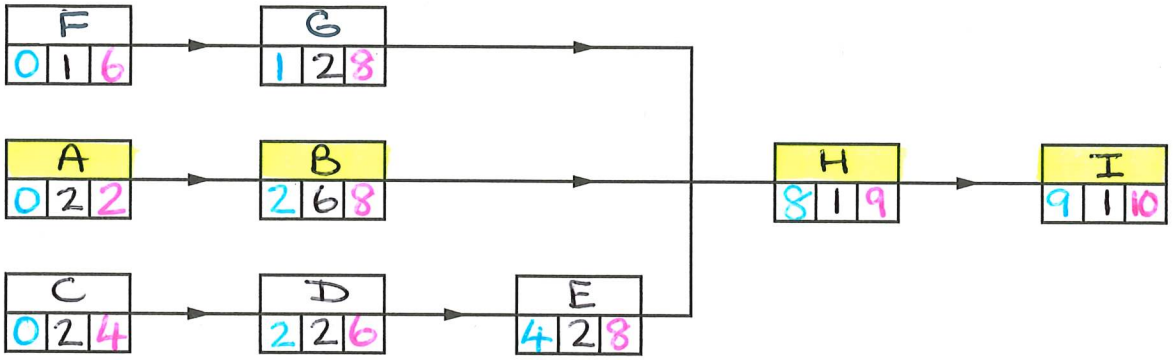
4. **(continued)**

(a) State the critical path. **1**

A – B – H – I

(b) Complete the PERT chart showing the earliest start time and the latest completion time for each task. **4**

(An additional diagram, if required, can be found on *page 21*.)



(c) Determine the minimum time taken to make each teddy bear when only two employees are available. **1**

Tasks F and G can be reallocated (3 hours)

2 hours can be absorbed in float time.

The process will take 1 hour longer = 11 hours

[Turn over

5. You must refer to the spreadsheet file 'Q5 Radio.csv' for the data, and the word processing file 'Q5 Radio Answers.docx' when answering this question.

You must complete parts (a) (i) and (a) (iii) using appropriate statistical software.

You must include all output from statistical software, and your answers in the word processing file 'Q5 Radio Answers.docx'.

A radio station asks their listeners to report how many hours they are listening for one week in July.

(a) (i) Construct a histogram to summarise the data. **1**

(ii) Describe the distribution of the data shown in the histogram. **1**

(iii) Hence, generate and state the appropriate measure of location to summarise the data. **2**

The data is then used to determine listening hours last summer.

(b) State one reason why the data might misrepresent the listening hours last summer. **1**

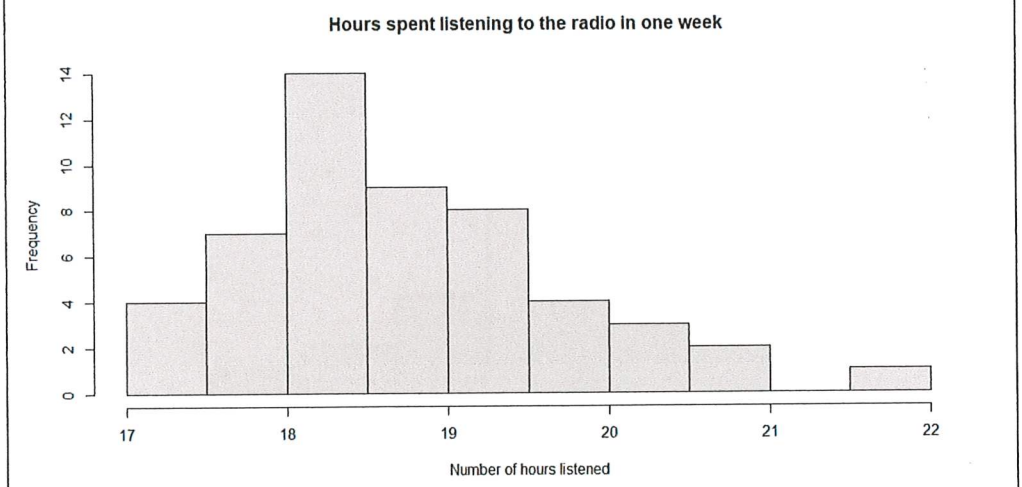
Print the word processing file 'Q5 Radio Answers.docx'.

Name: H WALLACE SCN:

Centre name: WORKED SOLUTION (R-STUDIO)

(a) (i)

Statistical software output:



(ii)

Answer:

The data is skewed, with a right tail.

(iii)

Statistical software output:

```
> summary(hours)
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  17.30   18.10   18.70   18.83   19.32   22.00
```

Answer:

Measure of location is 18.7 hours.

(b)

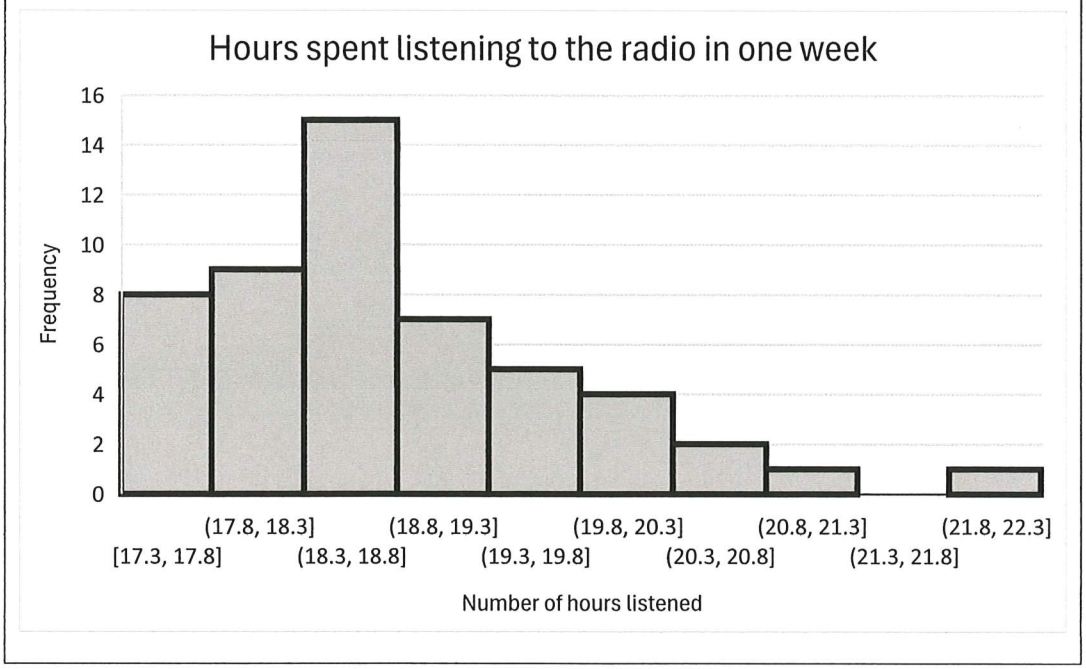
Answer:

The data was self-gathered by listeners, and does not include a random sample.

Name:	H WALLACE	SCN:								
Centre name:	WORKED SOLUTION (EXCEL)									

(a) (i)

Statistical software output:



(ii)

Answer:

The data is skewed, with a right tail.

(iii)

Statistical software output:

```
=MEDIAN(A2:A53)
```

Answer:

Measure of location is 18.7 hours.

(b)

Answer:

The data was self-gathered by listeners, and does not include a random sample.

MARKS | DO NOT WRITE IN THIS MARGIN

6. You must refer to the information on 'Lifetime ISA' given in the pre-release material when answering this question.

Morgan opens a Lifetime ISA with an online bank. The account has an annual effective rate of interest of 3.25%.

Morgan makes a deposit of £2500 into the account on 1 January 2024. The government bonus is paid into her account on the first day of the following month.

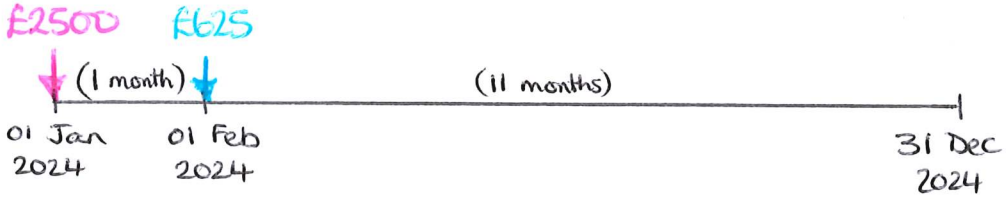
She makes no further deposits in 2024.

Calculate the accumulated value of Morgan's Lifetime ISA on 31 December 2024. 4

100% + 3.25% = 103.25% = 1.0325

Government bonus = 25% of £2500 = £625

Bonus does not gain interest in initial month.



Accumulated Value by 31 Dec = £2500 × 1.0325 + £625 × $1.0325^{\frac{11}{12}}$

= 2581.25 + 643.59

= £3224.84

[Turn over

7. An events management company has been awarded a contract to construct the stages for a music festival.

If the construction of the stages is delayed the contract says that a penalty of £25,000 will be charged.

For the purposes of the cost-benefit analysis, the company has assumed only two events will cause a delay:

- a stage structure failing
- staff failing to attend the site.

The probability of **no delay** is 0.76.

(a) Calculate the expected cost of a delay. **2**

P(delay) = 1 − 0.76 = 0.24

Expected cost of delay = 0.24 × £25,000

= £6000

7. **(continued)**

The company is considering using the following control measures:

- Control Measure 1 — Pay another company to have staff on standby to attend the site in the case of their staff being unable to attend, at a cost of £1000.
- Control Measure 2 — Have a spare stage on standby in case of a failure, at a cost of £1500.

The probability of staff failing to attend the site is 0.2.

The probability of a stage structure failing is 0.05.

(b) Calculate the expected cost if control measure 2 is taken. **1**

Expected cost (Control measure 2) = £1500 + 0.2 × £25000

= 1500 + 5000

= £6500

The expected cost if control measure 1 is taken is £2250.

The company will only use one control measure.

(c) Explain which control measure the company should use to minimise expected costs. **1**

Control Measure	Costs
1	£2250
2	£6500

The company should choose control measure 1 as it has the lowest expected cost.

MARKS | DO NOT WRITE IN THIS MARGIN

8. You must refer to the spreadsheet file 'Q8 Finance.xlsx' when answering this question.

You must complete parts (a) and (c) using the spreadsheet file.

Part (b) must be completed in the answer space provided.

Martin is buying a car for £7500. The garage offered Martin the finance package below:

- 20% deposit
- 35 level monthly repayments of £216.77
- final monthly repayment £216.13.

(a) Open the 'Car Finance' worksheet.

Complete the loan schedule to determine the annual effective rate of interest that is being charged for the finance package. **5**

Car insurance is a legal requirement for cars driven on UK roads.

(b) Explain the purpose of car insurance. **1**

Car insurance gives the policy holder protection against any potential loss such as being involved in an accident, or the car is stolen.

VALUE VIEW.

	A	B	C	D	E	F
1		Name:	H WALLACE			
2		SCN:				
3		Centre name:	WORKED SOLUTIONS			
4						
5		Bank loan repayment schedule				
6						
7		Cost of car	£7,500.00			
8		Initial loan amount	£6,000.00			
9		Annual effective rate of interest	19.5%			
10		Monthly effective rate of interest	1.496%			
11		Loan period (months)	36			
12		Monthly repayment amount	£216.77			
13		Final repayment amount	£216.13			
14						
15						
16		Time (months)	Repayment (£)	Interest content of repayment (£)	Capital content of repayment (£)	Loan outstanding (£)
17		0				6000.00
18		1	216.77	89.74	127.03	5872.97
19		2	216.77	87.84	128.93	5744.04
20		3	216.77	85.91	130.86	5613.18
21		4	216.77	83.95	132.82	5480.36
22		5	216.77	81.97	134.80	5345.56
23		6	216.77	79.95	136.82	5208.74
24		7	216.77	77.90	138.87	5069.87
25		8	216.77	75.83	140.94	4928.93
26		9	216.77	73.72	143.05	4785.88
27		10	216.77	71.58	145.19	4640.69
28		11	216.77	69.41	147.36	4493.33
29		12	216.77	67.20	149.57	4343.76
30		13	216.77	64.97	151.80	4191.96
31		14	216.77	62.70	154.07	4037.89
32		15	216.77	60.39	156.38	3881.51
33		16	216.77	58.05	158.72	3722.79
34		17	216.77	55.68	161.09	3561.70
35		18	216.77	53.27	163.50	3398.20
36		19	216.77	50.82	165.95	3232.25
37		20	216.77	48.34	168.43	3063.82
38		21	216.77	45.82	170.95	2892.87
39		22	216.77	43.27	173.50	2719.37
40		23	216.77	40.67	176.10	2543.27
41		24	216.77	38.04	178.73	2364.54
42		25	216.77	35.36	181.41	2183.13
43		26	216.77	32.65	184.12	1999.01
44		27	216.77	29.90	186.87	1812.14
45		28	216.77	27.10	189.67	1622.47
46		29	216.77	24.27	192.50	1429.97
47		30	216.77	21.39	195.38	1234.59
48		31	216.77	18.46	198.31	1036.28
49		32	216.77	15.50	201.27	835.01
50		33	216.77	12.49	204.28	630.73
51		34	216.77	9.43	207.34	423.39
52		35	216.77	6.33	210.44	212.95
53		36	216.13	3.18	212.95	0.00

Question 8 (a)

FORMULAE VIEW.

	A	B	C	D	E	F
1		Name:	H WALLACE			
2		SCN:				
3		Centre name:	WORKED SOLUTIONS			
4						
5		Bank loan repayment schedule				
6						
7		Cost of car	7500			
8		Initial loan amount	=0.8*C7			
9		Annual effective rate of interest	0.195001300495969			
10		Monthly effective rate of interest	=(1+C9)^(1/12)-1			
11		Loan period (months)	36			
12		Monthly repayment amount	216.77			
13		Final repayment amount	216.13			
14						
15						
16		Time (months)	Repayment (£)	Interest content of repayment (£)	Capital content of repayment (£)	Loan outstanding (£)
17		0				=$C$8
18		1	=$C$12	=ROUND(F17*$C$10,2)	=C18-D18	=F17-E18
19		2	=$C$12	=ROUND(F18*$C$10,2)	=C19-D19	=F18-E19
20		3	=$C$12	=ROUND(F19*$C$10,2)	=C20-D20	=F19-E20
21		4	=$C$12	=ROUND(F20*$C$10,2)	=C21-D21	=F20-E21
22		5	=$C$12	=ROUND(F21*$C$10,2)	=C22-D22	=F21-E22
23		6	=$C$12	=ROUND(F22*$C$10,2)	=C23-D23	=F22-E23
24		7	=$C$12	=ROUND(F23*$C$10,2)	=C24-D24	=F23-E24
25		8	=$C$12	=ROUND(F24*$C$10,2)	=C25-D25	=F24-E25
26		9	=$C$12	=ROUND(F25*$C$10,2)	=C26-D26	=F25-E26
27		10	=$C$12	=ROUND(F26*$C$10,2)	=C27-D27	=F26-E27
28		11	=$C$12	=ROUND(F27*$C$10,2)	=C28-D28	=F27-E28
29		12	=$C$12	=ROUND(F28*$C$10,2)	=C29-D29	=F28-E29
30		13	=$C$12	=ROUND(F29*$C$10,2)	=C30-D30	=F29-E30
31		14	=$C$12	=ROUND(F30*$C$10,2)	=C31-D31	=F30-E31
32		15	=$C$12	=ROUND(F31*$C$10,2)	=C32-D32	=F31-E32
33		16	=$C$12	=ROUND(F32*$C$10,2)	=C33-D33	=F32-E33
34		17	=$C$12	=ROUND(F33*$C$10,2)	=C34-D34	=F33-E34
35		18	=$C$12	=ROUND(F34*$C$10,2)	=C35-D35	=F34-E35
36		19	=$C$12	=ROUND(F35*$C$10,2)	=C36-D36	=F35-E36
37		20	=$C$12	=ROUND(F36*$C$10,2)	=C37-D37	=F36-E37
38		21	=$C$12	=ROUND(F37*$C$10,2)	=C38-D38	=F37-E38
39		22	=$C$12	=ROUND(F38*$C$10,2)	=C39-D39	=F38-E39
40		23	=$C$12	=ROUND(F39*$C$10,2)	=C40-D40	=F39-E40
41		24	=$C$12	=ROUND(F40*$C$10,2)	=C41-D41	=F40-E41
42		25	=$C$12	=ROUND(F41*$C$10,2)	=C42-D42	=F41-E42
43		26	=$C$12	=ROUND(F42*$C$10,2)	=C43-D43	=F42-E43
44		27	=$C$12	=ROUND(F43*$C$10,2)	=C44-D44	=F43-E44
45		28	=$C$12	=ROUND(F44*$C$10,2)	=C45-D45	=F44-E45
46		29	=$C$12	=ROUND(F45*$C$10,2)	=C46-D46	=F45-E46
47		30	=$C$12	=ROUND(F46*$C$10,2)	=C47-D47	=F46-E47

Question 8 (a)

	A	B	C	D	E	F
1		Name:	H WALLACE			
2		SCN:				
3		Centre name:	WORKED SOLUTIONS			
4						
5		Bank loan repayment schedule				
48		31	=$C$12	=ROUND(F47*$C$10,2)	=C48-D48	=F47-E48
49		32	=$C$12	=ROUND(F48*$C$10,2)	=C49-D49	=F48-E49
50		33	=$C$12	=ROUND(F49*$C$10,2)	=C50-D50	=F49-E50
51		34	=$C$12	=ROUND(F50*$C$10,2)	=C51-D51	=F50-E51
52		35	=$C$12	=ROUND(F51*$C$10,2)	=C52-D52	=F51-E52
53		36	=$C$13	=ROUND(F52*$C$10,2)	=C53-D53	=F52-E53

8. (continued)

Martin has been saving for the deposit and car insurance. He opened a savings account with an initial deposit of £500 on 1 August 2023.

He made regular monthly payments of £250 into the account on the first day of each month from 1 September 2023. The effective rates of interest for the savings account are as follows.

Dates	Effective rate of interest
1 August 2023 to 30 November 2023	0.24% per month
From 1 December 2023	3.1% per year

(c) Open the 'Savings' worksheet.

Calculate the balance in Martin's savings account immediately before he makes his payment on 1 August 2024. **4**

Print the 'Car Finance' worksheet in value view and in formula view.

Print the 'Savings' worksheet in value view and in formula view.

[Turn over

Question 8 (c)

VALUE VIEW

	A	B	C	D	E
1		Name:	H WALLACE		
2		SCN:			
3		Centre name:	WORKED SOLUTIONS		
4					
5					
6		**Savings Schedule**			
7		Initial deposit	£ 500.00		
8					
9		Monthly effective rate of interest from 1 August 2023 to 30 November 2023	0.240%		
10					
11		Annual effective rate of interest from 1 December 2023	3.1%		
12		Monthly effective rate of interest from 1 December 2023	0.255%		
13					
14		Regular monthly payment	£ 250.00		
15					
16		Account balance before payment is made on 1 August 2024	£ 3,307.36		
17					

18	Date	Account balance before payment (£)	Payment (£)	Balance after payment (£)
19	01 August 2023	0.00	500.00	500.00
20	01 September 2023	501.20	250.00	751.20
21	01 October 2023	753.00	250.00	1003.00
22	01 November 2023	1005.41	250.00	1255.41
23	01 December 2023	1258.42	250.00	1508.42
24	01 January 2024	1512.26	250.00	1762.26
25	01 February 2024	1766.75	250.00	2016.75
26	01 March 2024	2021.89	250.00	2271.89
27	01 April 2024	2277.68	250.00	2527.68
28	01 May 2024	2534.12	250.00	2784.12
29	01 June 2024	2791.21	250.00	3041.21
30	01 July 2024	3048.96	250.00	3298.96
31	01 August 2024	3307.36	250.00	3557.36

Question 8 (c)

FORMULAE VIEW.

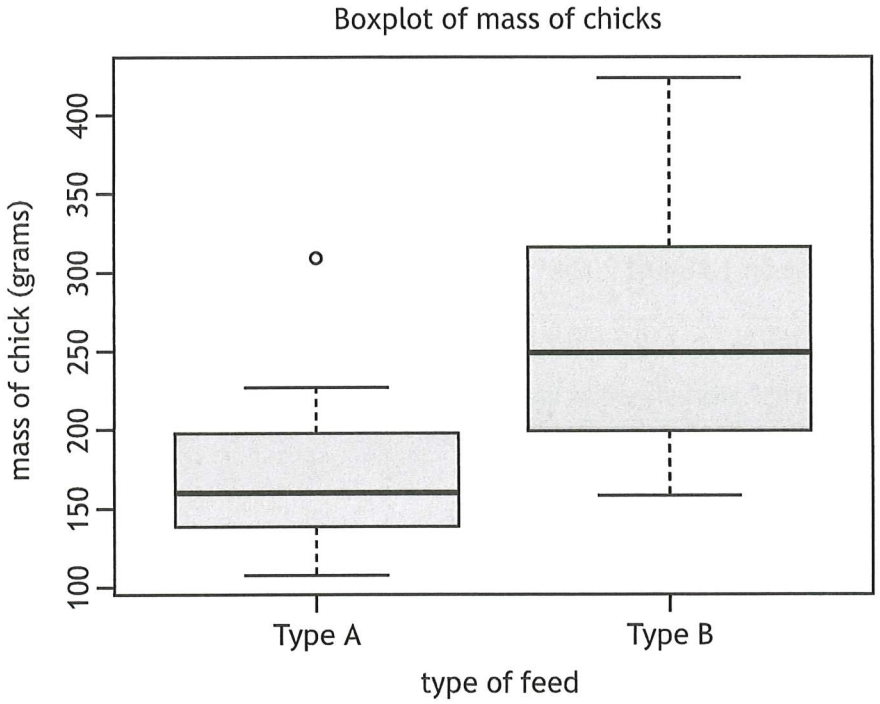
	A	B	C	D	E
1		Name:	H WALLACE		
2		SCN:			
3		Centre name:	WORKED SOLUTIONS		
4					
5					
6		Savings Schedule	500		
7		Initial deposit			
8			0.0024		
9		Monthly effective rate of interest from 1 August 2023 to 30 November 2023			
10			0.031		
11		Annual effective rate of interest from 1 December 2023	=(1+C11)^(1/12)-1		
12		Monthly effective rate of interest from 1 December 2023			
13			250		
14		Regular monthly payment			
15			=C31		
16		Account balance before payment is made on 1 August 2024			
17					
18		Date	Account balance before payment (£)	Payment (£)	Balance after payment (£)
19		45139	0	500	500
20		45170	=ROUND(E19*(1+$C$9),2)	=$C$14	=C20+D20
21		45200	=ROUND(E20*(1+$C$9),2)	=$C$14	=C21+D21
22		45231	=ROUND(E21*(1+$C$9),2)	=$C$14	=C22+D22
23		45261	=ROUND(E22*(1+$C$9),2)	=$C$14	=C23+D23
24		45292	=ROUND(E23*(1+$C$12),2)	=$C$14	=C24+D24
25		45323	=ROUND(E24*(1+$C$12),2)	=$C$14	=C25+D25
26		45352	=ROUND(E25*(1+$C$12),2)	=$C$14	=C26+D26
27		45383	=ROUND(E26*(1+$C$12),2)	=$C$14	=C27+D27
28		45413	=ROUND(E27*(1+$C$12),2)	=$C$14	=C28+D28
29		45444	=ROUND(E28*(1+$C$12),2)	=$C$14	=C29+D29
30		45474	=ROUND(E29*(1+$C$12),2)	=$C$14	=C30+D30
31		45505	=ROUND(E30*(1+$C$12),2)	=$C$14	=C31+D31

9. You must refer to the information on 'Feeding chicks' given in the pre-release material when answering this question.

To monitor the effect of the type of feed on their mass, a group of chicks were randomly allocated into two groups at birth.

One group was given feed type A and the second group was given feed type B from birth.

The comparative boxplot summarises the mass of chicks, in grams, when weighed at three weeks old.



(a) Explain which type of feed results in chicks with the least variability in mass. **1**

Type A feed results in chicks with the least variability in mass as the smaller box shows us that the Interquartile Range is smaller.

9. **(continued)**

MARKS | DO NOT WRITE IN THIS MARGIN

A hypothesis test was performed to compare the two groups.

(b) (i) State the hypothesis test performed. **1**

Two-sample t-test.

(ii) Hence state the null and alternative hypotheses. **1**

NULL: There is no difference in the mean mass of chicks fed with Type A and Type B.
ALTERNATIVE: There is a difference in the mean mass of the chicks.

The p-value was 0.003147.

(iii) Interpret the p-value, and the result of the hypothesis test, in context. **2**

Since $p < 0.05$, then we reject the null hypothesis, as there is a significant difference in mean mass of the chicks.

The type of feed used for one group of chicks is sold in 4.5 kilogram bags.
The nutritional content is shown.

Nutritional content of feed	
Protein	720 g
Fat	150 g
Fibre	320 g
Other	3310 g

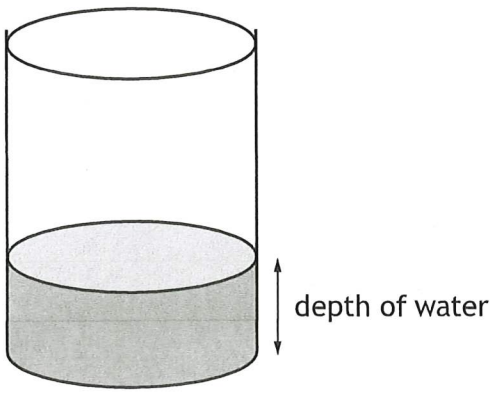
(c) Explain whether this nutritional information is more likely to be for feed type A or type B. **1**

Protein content $= \frac{720}{4500} \times 100 = 16\% < 20\%$

This nutritional information is likely from Type A, when the protein content is less than 20%.

10. A cylindrical container is being filled with water.

MARKS | DO NOT WRITE IN THIS MARGIN

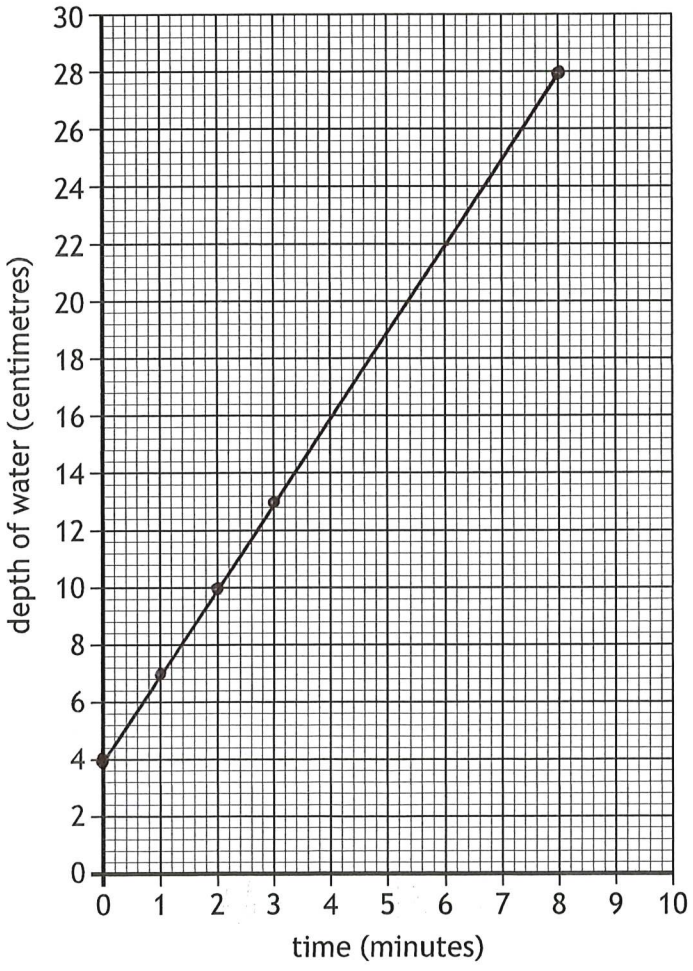


- Initially, the depth of water is 4 centimetres.
- The depth of the water in the container increases at a constant rate of 3 centimetres per minute.
- It takes 8 minutes to finish filling the container.

(a) Draw a graph to model how the depth of water in the container changes over time until it is filled. Use the axes provided. **3**

(An additional diagram, if required, can be found on *page 22*.)

Filling a cylindrical container



MARKS | DO NOT WRITE IN THIS MARGIN

10. (continued)

(b) (i) State the type of relationship modelled in your graph. **1**

Positive linear relationship.

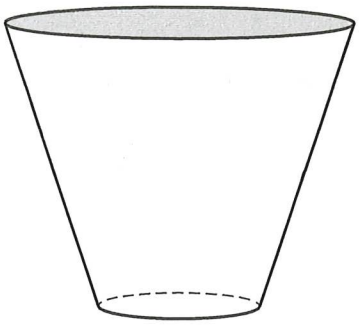
(ii) State the dependent variable in your graph. **1**

Depth of water.

[Turn over

10. (continued)

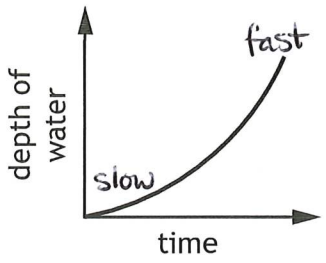
Another container is shown below.



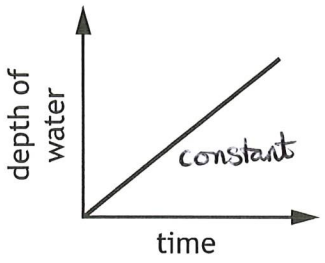
This container is also filled with water at a constant rate of 5 cubic centimetres per second.

Three graphs are shown below showing how the depth of water in the container changes over time.

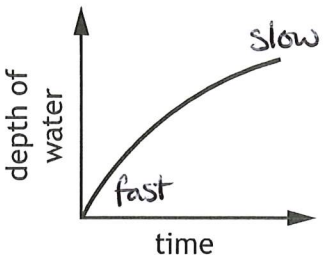
Graph A



Graph B



Graph C



(c) Explain which graph could model the depth of water in the container. **2**

The container will fill faster at the start then slow, so the depth will increase faster at the start, then slow.

↳ Graph C.

MARKS | DO NOT WRITE IN THIS MARGIN

11. Freddie has a credit card with an annual effective rate of interest of 29.9%. Interest is applied at the end of each month.

Payments must be made on the first day of each month. The minimum payment must be either 5% of the balance outstanding at that time or £5, whichever is higher.

After Freddie makes his payment on 1 March, the balance of his credit card was £823.19.

Freddie does not use his credit card during March.

(a) Calculate the balance of his credit card on 1 April after Freddie has made the minimum payment. 3

monthly effective rate $= (1.299^{1/12} - 1) \times 100 = 2.20389\%$

Accumulated Balance on 31 March $= £823.19 \times 1.0220389\ldots$
$= £841.33$

5% of balance $= 5\%$ of $841.33 = £42.07$

$\therefore$ minimum payment $= £42.07$

Balance on 1st April $= 841.33 - 42.07 = £799.26$

(b) Give one reason why Freddie should consider paying the full balance of his credit card each month. 1

Paying the full balance will avoid additional interest charges.

MARKS | DO NOT WRITE IN THIS MARGIN

12. You must refer to the spreadsheet file 'Q12 Eye Colour.xlsx' when answering this question.

You must complete parts (a), (b) and (c) using the spreadsheet file.

A random sample of 50 children were invited to take part in a general health study. They were asked to answer the following questions:

- State your sex.

  Please select from: male, female, prefer not to say

- State your eye colour.

  Please select from: blue, brown, green

- Are you colour blind?

  Please select from: yes, no

The responses from the survey were partially entered into a 'Participant Responses' table.

Participants 3, 7, 13, and 18 responded 'yes' to being colour blind.

All other participants were not colour blind.

Participant 42 has withdrawn their consent for their responses to be included in the data.

Open the 'Eye Colour' worksheet.

(a) Complete the 'Participant Responses' table using the information above. **2**

(b) Complete the 'Eye Colour Summary' table. **2**

(c) Create an appropriate chart to display the frequencies in the 'Eye Colour Summary' data. **3**

Print the 'Eye Colour' worksheet in value view and formula view.

Ensure the chart is visible and contained on one page in each printout.

[END OF QUESTION PAPER]

VALUE VIEW.

Name: H WALLACE

SCN:

Centre name: WORKED SOLUTIONS

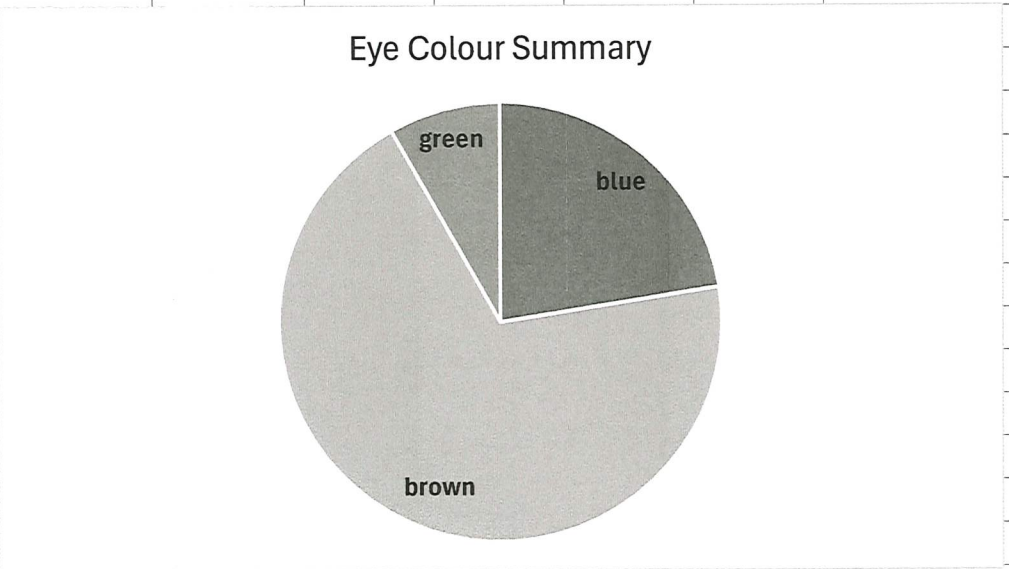
Participant Responses

Participant	Sex	Eye Colour	Colour Blind
1	female	brown	NO
2	female	brown	NO
3	female	brown	YES
4	female	blue	NO
5	female	brown	NO
6	male	green	NO
7	male	brown	YES
8	male	brown	NO
9	female	blue	NO
10	male	blue	NO
11	female	brown	NO
12	male	blue	NO
13	male	brown	YES
14	male	brown	NO
15	male	blue	NO
16	female	blue	NO
17	female	brown	NO
18	male	brown	YES
19	female	blue	NO
20	male	green	NO
21	male	brown	NO
22	male	brown	NO
23	male	green	NO

Eye Colour Summary

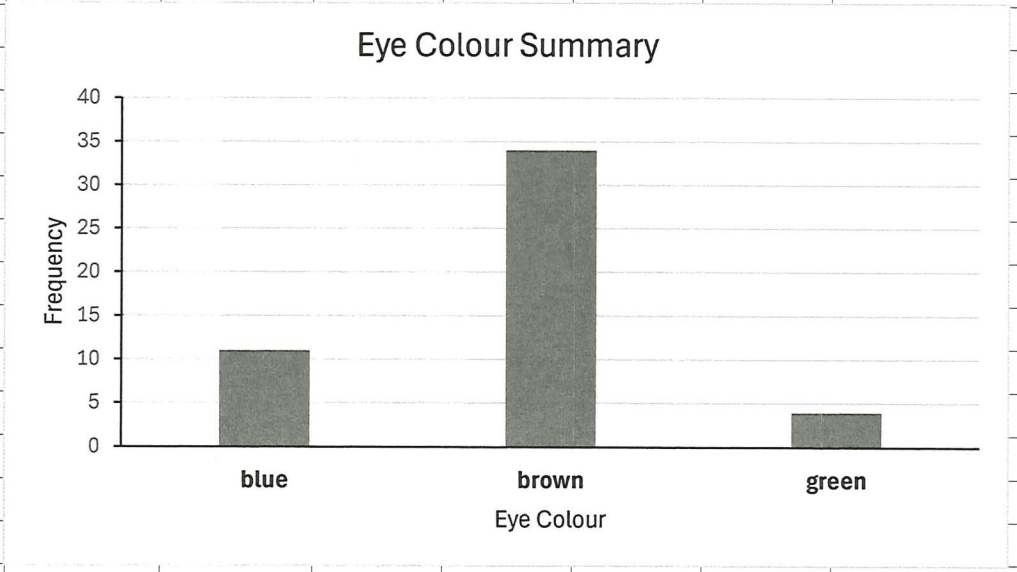
Eye Colour	Frequency
blue	11
brown	34
green	4

Only one graph is required. Pie Chart or Bar Chart are acceptable.



Question 12

	A	B	C	D	E	F	G	H	I	J	K	L
1									Name:	H WALLACE		
2									SCN:			
3									Centre name:	WORKED SOLUTIONS		
29	24	male	brown	NO								
30	25	female	brown	NO								
31	26	male	blue	NO								
32	27	male	brown	NO								
33	28	male	green	NO								
34	29	male	blue	NO								
35	30	female	brown	NO								
36	31	male	brown	NO								
37	32	female	brown	NO								
38	33	male	brown	NO								
39	34	male	brown	NO								
40	35	male	brown	NO								
41	36	female	brown	NO								
42	37	female	brown	NO								
43	38	female	brown	NO								
44	39	female	brown	NO								
45	40	female	brown	NO								
46	41	male	blue	NO								
47	43	male	brown	NO								
48	44	male	brown	NO								
49	45	male	brown	NO								
50	46	male	brown	NO								
51	47	male	brown	NO								
52	48	male	brown	NO								
53	49	male	blue	NO								
54	50	male	brown	NO								



Question 12

FORMULAE VIEW.

	A	B	C	D	E	F	G	H	I	J	K	L
1									Name:	H WALLACE		
2									SCN:			
3									Centre name:	WORKED SOLUTIONS		
4	Participant Responses					Eye Colour Summary						
5	Participant	Sex	Eye Colour	Colour Blind		Eye Colour	Frequency					
6	1	female	brown	NO		blue	=COUNTIF(C6:C54,F6)					
7	2	female	brown	NO		brown	=COUNTIF(C6:C54,F7)					
8	3	female	brown	YES		green	=COUNTIF(C6:C54,F8)					
9	4	female	blue	NO								
10	5	female	brown	NO								
11	6	male	green	NO								
12	7	male	brown	YES								
13	8	male	brown	NO								
14	9	female	blue	NO								
15	10	male	blue	NO								
16	11	female	brown	NO								
17	12	male	blue	NO								
18	13	male	brown	YES								
19	14	male	brown	NO								
20	15	male	blue	NO								
21	16	female	blue	NO								
22	17	female	brown	NO								
23	18	male	brown	YES								
24	19	female	blue	NO								
25	20	male	green	NO								
26	21	male	brown	NO								
27	22	male	brown	NO								
28	23	male	green	NO								
29	24	male	brown	NO								
30	25	female	brown	NO								
31	26	male	blue	NO								
32	27	male	brown	NO								
33	28	male	green	NO								
34	29	male	blue	NO								
35	30	female	brown	NO								
36	31	male	brown	NO								
37	32	female	brown	NO								
38	33	male	brown	NO								
39	34	male	brown	NO								
40	35	male	brown	NO								
41	36	female	brown	NO								
42	37	female	brown	NO								
43	38	female	brown	NO								
44	39	female	brown	NO								
45	40	female	brown	NO								
46	41	male	blue	NO								
47	43	male	brown	NO								
48	44	male	brown	NO								
49	45	male	brown	NO								
50	46	male	brown	NO								
51	47	male	brown	NO								
52	48	male	brown	NO								
53	49	male	blue	NO								
54	50	male	brown	NO								

Only one graph is required. Pie Chart or Bar Chart are acceptable.