



Duration – 50 minutes



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 – 35

Attempt ALL questions.

You must NOT 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.

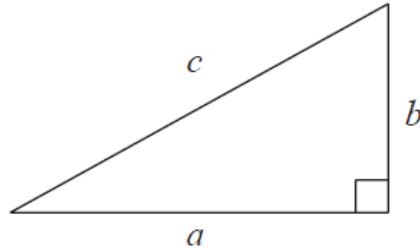
Before leaving the examination room you must give this booklet to the Invigilator; if you do not, you may lose all the marks for this paper.

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 $V = Ah$

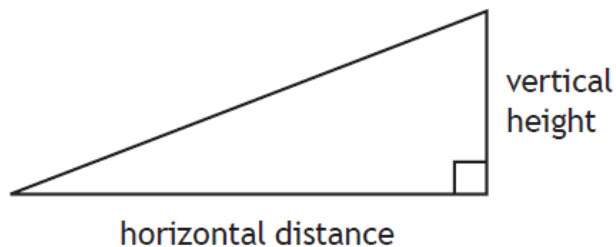
Volume of a cone $V = \frac{1}{3} \pi r^2 h$

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

Standard deviation $s = \sqrt{\frac{\sum(x - \bar{x})^2}{n - 1}}$

or $s = \sqrt{\frac{\sum x^2 - \frac{(\sum x)^2}{n}}{n - 1}}$, where n is the sample size.

Gradient



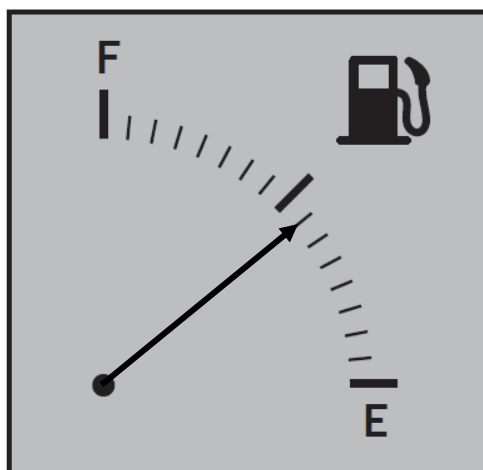
$$\text{gradient} = \frac{\text{vertical height}}{\text{horizontal distance}}$$

Total marks – 35
Attempt ALL questions

DO NOT
WRITE IN
THIS
MARGIN

MARKS

1. Allistair has to travel 150 miles for a work meeting.
The diagram below shows how much fuel is currently in his car.



When the car is completely filled, there is enough fuel to travel 320 miles.

Allistair thinks he has enough fuel for his journey.
Determine whether he is correct.

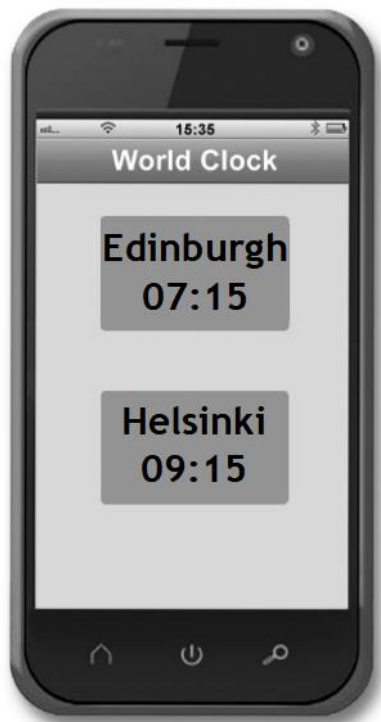
2

2. At a meeting, employees have the option of a cup of tea, a cup of coffee or a glass of water.
- $\frac{2}{9}$ of the employees asked for a cup of tea
 - $\frac{3}{8}$ of the employees asked for a cup of coffee
 - the rest of employees asked for a glass of water.

Calculate the fraction of employees who asked for a glass of water.

3

3. Vicki is in Helsinki on holiday.
She looks at the World Clock app on her phone and sees the following:



Her flight to Edinburgh departs Helsinki at 10:00 local time.
The flight time is 2 hours and 30 minutes.

Vicki books her taxi at Edinburgh airport for 11:00 local time.
Determine whether Vicki will be on time for her taxi.

2

[Turn over

4. Jamie works as a cashier in a supermarket.
His basic wage is £7.40 per hour. His overtime rate is time-and-a-half.
In a given week, Jamie completes 40 hours basic plus **10 hours overtime**.
Each week he pays £28.43 Income Tax and £8.57 in National Insurance.
- (a) Calculate his take home pay for this week.

3

Jamie is going on holiday in 7 weeks. The holiday costs £650 and he wants to take £350 spending money.

Jamie makes a table to show his weekly income and outgoings.
He puts any leftover money into his holiday fund.

	Income	Outgoings
Take home pay		
Rent		£76
Bills		£41
Food		£45
Entertainment		£30
Transport		£23
Holiday Fund		

- (b) Determine whether Jamie will have enough money to cover the cost of the holiday and his spending money.

Justify your answer by calculation.

2

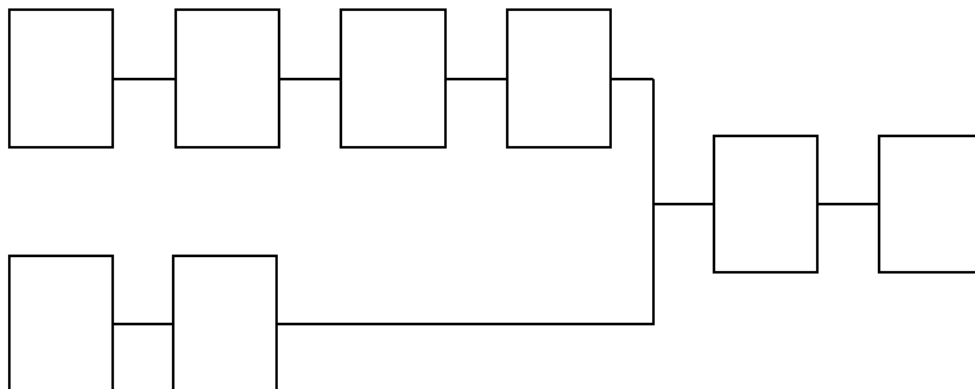
[Turn over

5. Sanja is washing the dishes.

The table below shows list of tasks and time taken to complete the task.

Activity	Description	Preceding task	Time (minutes)
A	Turn on the water heater	None	5
B	Put away previously dry plates	None	2
C	Turn on water tap to fill the sink	D	3
D	Put plug into sink	A	1
E	Collect dirty dishes	B	2
F	Add washing up liquid	C	1
G	Wash dishes	F, E	15
H	Leave to dry	G	10

(a) Complete the diagram below to show the tasks and times in the boxes. 2



Sanja thinks that if she starts washing the dishes at 5.45 pm, she will finish by 6.15 pm.

(b) Based on the times given, determine if Sanja is correct. 2

[Turn over

6. At the end of the week, staff in a school can order a free coffee.

They can choose from a latte, cappuccino or mocha.

(a) The total number of coffees ordered is split in the ratio 4 : 7 : 9.

There are 12 lattes on order.

Calculate the total number of coffees ordered.

2

The temperature of each coffee should be $70^{\circ}\text{C} \pm 10\%$.

The temperatures, to the nearest degree Celsius, of ten of these coffees are recorded.

70 80 78 75 69 63 67 79 71

(b) State the maximum and minimum acceptable temperatures and calculate the fraction of coffees which are at an acceptable temperature.

3

[Turn over

7. Stirling FC record their ball possession (%) over their first 12 games of the season.

The data for the first 12 games are listed below.

70 68 73 70 67 78 74 73 74 76 78 76

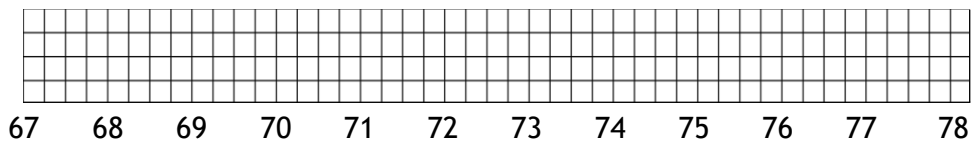
(a) For this data, calculate:

- the median
- the lower quartile
- the upper quartile.

2

(b) Construct a boxplot for this set of data.

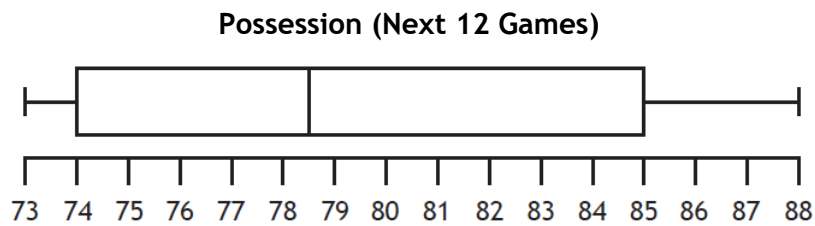
2



(c) Calculate the interquartile range for the first 12 league games.

1

The boxplot shows the ball possession for the next 12 games.



(d) Make one valid comment comparing the ball possession in the first 12 games and the next 12 games.

1

[Turn over

8. Two dice are rolled simultaneously.

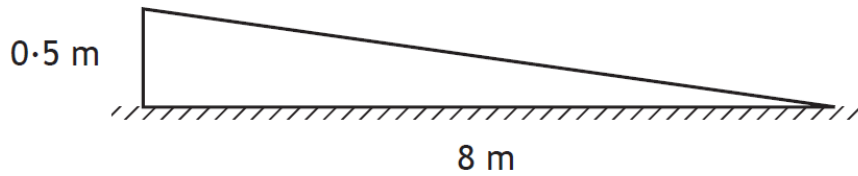


The numbers on the dice are **added together**.

Calculate the probability of rolling a number which is less than 9 but greater than 5.

3

9. A ramp is being built to access a garden.

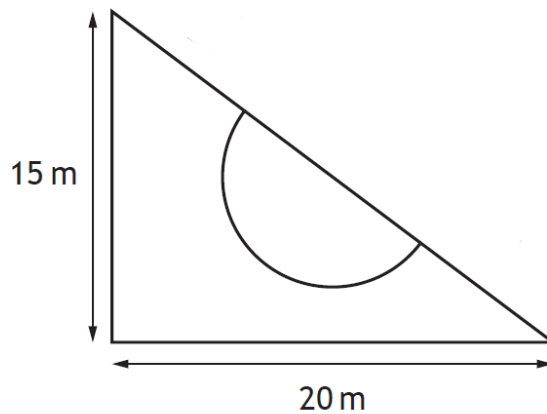


- (a) Calculate the gradient of the ramp.

Give your answer as a fraction in its simplest form.

2

The garden is in the shape of a right-angled triangle with a semi-circular flower bed as shown below.



The garden, excluding the flower bed, will be covered with grass.
The diameter of the flower bed is 8 metres.

- (b) Calculate the area to be covered with grass.

3

ADDITIONAL SPACE FOR ANSWERS

DO NOT
WRITE IN
THIS
MARGIN