Sample papers

NCFE Level 2 Certificate in Maths
QN: 601/1091/0

This Sample Assessment Paper has been designed to provide you with exemplar tasks and questions for the NCFE Level 2 Maths suite of qualifications.

The questions and tasked are mapped to 100% of the learning outcomes and assessment criteria within the qualifications, however in order to achieve full and consistent coverage, we advise that you also provide supplementary forms of evidence.

Working with algebra
Section A: Work with algebraic expressions

A.1 What do the symbols in the table below mean?

Symbol	Meaning
$>$	
$\geq$	

A.2 Solve this linear equation for x: 3x – 18 = 6

A.3 Solve this linear equation for x: 2x + 15 = 9

A.4 Solve this linear equation for x: 10x + 8 = 2x + 40

A.5 Solve this linear equation for x: 5x – 9 = 12 – 4x

A.6 Solve the following linear inequality for a: $7a + 5 < 33$

A.7 Solve the following linear inequality for x: $4x + 5 < 28$

A.8 Solve the following linear inequality for x: $x + 3 \geq 5x - 2$

A.9 Simplify $7 (2x + 5) - 4(x + 2)$

A.10 Simplify $4a + 6(9a - 2) + 11$

Working with decimals and percentages test 1 (non-calculator paper)
Section A: Work with decimals

A.1 Write down the value of each underlined digit in the numbers below:

(a) 536.09
(b) 231.079
(c) 14.52

A.2 Create a place value table and place the following numbers into it:

(a) 203.349
(b) 91.750
(c) 1.325

A.3 Round the following numbers to one decimal place (1dp):

(a) 9.533333
(b) 91.7508
(c) 12.08051

A.4 Round the following numbers to three decimal places (3dp):

(a) 0.97386
(b) 27.90109
(c) 17.6999

Section B: Perform calculations with numbers of up to three decimal places

B.1 Calculate 27.16 + 9.321

Working

Answer

B.2 Calculate 29.04 – 11.361

Working

Answer

B.3 Calculate 20 x 0.02

Working

Answer

B.4 Calculate 450 ÷ 0.001

Working

Answer

B.5 Calculate 9.9 – 7.2 + 3.012

Working

Answer

B.6 Calculate 4.25 ÷ (4.3 + 0.7)

Working

Answer

B.7 Calculate (23.4 x 7.1) – 8.34

Working

Answer

B.8 Evaluate 82.8 ÷ (1.8 – 0.9)

Working

Answer

Section C: Be able to perform calculations using percentages

C.1 Look at the table below and evaluate which column (A or B) is the bigger amount, then put your answer in the last column. The first one is done for you.

A		**B**	**Answer (A or B)**
50% of 150	or	25% of 400	B
25% of 80	or	20% of 90	
33% of 350	or	66% of 270	
15% of 210	or	30% of 120	
115% of 200	or	75% of 250	
65% of 150	or	75% of 140	

C.2 A shop keeper buys in some washing machines at £280 each. What price should he sell each washing machine for if he wants to make a profit of 45%?

Working

Answer

C.3 A worker earning £9 per hour gets a 4% pay rise. What is their new hourly rate?

Working

Answer

C.4 The price of a coat is £180. In the sale it is reduced by 20%. What is the sale price?

Working

Answer

C.5 The price of a jumper is £49.99. It is reduced by 12% in the sale. What is the sale price of the jumper?

Working

Answer

C.6 In a college of 2000 students, 1200 are male. What percentage of the class is female?

Working

Answer

C.7 A new brand of ice cream contains 500 g of fresh cream in every 750 g tub. What percentage of the ice cream is fresh cream? Round your answer to the nearest whole number.

Working

Answer

Test 2 (Use a calculator for this test)
Section C.2: Be able to perform calculations using percentages

C.2.1 A camera, which originally cost £150, has been reduced in price by £45. Calculate the reduction as a percentage.

C.2.2 There are 150 houses in Camberwick Green and 102 houses are lived in by families. What percentage is not lived in by families?

C.2.3 A college has 1500 students. A survey showed that 210 were vegetarian. What percentage is this?

C.2.4 Another college has 1254 students and 358 are part time. What percentage is this? Give your answer to two decimal places.

C.2.5 Last year Stephanie had £3800 in the bank and she received 6.4% interest on the money at the end of the year on this amount. How much interest did she receive?

Working with fractions
Section A: Use fractions to order and compare amounts and quantities

A.1 Convert these fractions to a common denominator and write them in order from smallest to largest:

$\frac{3}{5}$ $\frac{2}{3}$ $\frac{4}{5}$ $\frac{7}{15}$

A.2 Convert these fractions to a common denominator and write them in order from smallest to largest:

$\frac{5}{18}$ $\frac{1}{2}$ $\frac{5}{6}$ $\frac{2}{3}$

A.3 A recipe says to use 150 ml of water. What fraction of 600 ml is this?

A.4 A man orders 800 kg of coal. What fraction of a metric tonne is this?

Section B: Express equivalences between fractions, decimals and percentages

B.1 Which of these two fractions are equivalent?

(a) $\frac{3}{4}$

(b) $\frac{8}{12}$

(c) $\frac{6}{8}$

(d) $\frac{9}{10}$

B.2 Which two of these fractions are equivalent?

(a) $\frac{3}{5}$

(b) $\frac{4}{5}$

(c) $\frac{6}{10}$

(d) $\frac{4}{10}$

B.3 Which two of these fractions are equivalent?

(a) $\frac{14}{18}$

(b) $\frac{2}{3}$

(c) $\frac{9}{12}$

(d) $\frac{4}{10}$

(e) $\frac{10}{15}$

B.4 Write $\frac{4}{5}$ as a decimal

B.5 Write $\frac{5}{8}$ as decimal.

B.6 Write $\frac{3}{20}$ as a decimal.

B.7 Write $\frac{22}{25}$ as a percentage.

B.8 Write $\frac{3}{50}$ as a percentage.

B.9 Write $\frac{2}{5}$ as a percentage.

B.10 Write $\frac{12}{18}$ in its simplest form.

B.11 Write $\frac{6}{24}$ in its simplest form.

B.12 Write $\frac{56}{63}$ in its simplest form.

B.13 Write $\frac{102}{126}$ in its simplest form.

B.14 What is 65% as a fraction in its simplest form?

B.15 What is 93% as a fraction in its simplest form?

B.16 What is 8% as a fraction in its simplest form?

B.17 What is 84% as a fraction in its simplest form?

Section C: Use fractions to add and subtract amounts and quantities

C.1 What is $\frac{3}{7} + \frac{2}{7}$? Write your answer in its simplest form.

C.2 What is $\frac{11}{15} - \frac{2}{15}$? Write your answer in its simplest form.

C.3 What is $\frac{3}{4} + \frac{1}{5}$? Write your answer in its simplest form.

C.4 What is $\frac{7}{8} - \frac{1}{4}$? Write your answer in its simplest form.

C.5 What is $\frac{2}{5} + \frac{1}{2}$? Write your answer in its simplest form.

C.6 What is $1\frac{1}{4} + 3\frac{1}{2}$? Write your answer in its simplest form.

C.7 What is $8 - 1\frac{2}{7}$? Write your answer in its simplest form.

C.8 What is $33\frac{1}{3} + 2\frac{1}{2}$? Write your answer in its simplest form.

Section D: Use a calculator to work with fractions

D.1 Use a calculator to convert $\frac{135}{88}$ to a mixed number.

D.2 Use a calculator to convert $\frac{1792}{1640}$ to a mixed number.

D.3 Use a calculator to convert $23\frac{12}{35}$ to an improper fraction.

D.4 Use a calculator to convert $435\frac{12}{271}$ to an improper fraction.

D.5 Use a calculator with a fraction button to convert 0.45 to a fraction.

D.6 Use a calculator to convert 0.84 to a fraction.

Working with mathematical skills

Introduction

This assessment will assess how well you can use mathematics in everyday situations.

Scenario

It is your friend's birthday and you are baking them a cake, to be able to do this you must:

- buy the ingredients.

You have £20 to buy all of the ingredients required.

The ingredients required to make the cake are:

- 140 g of butter
- 140 g of caster sugar
- 2 eggs
- 140 g of flour
- 200 ml milk.

The ingredients required for the filling are:

- 100 g of butter
- 140 g of icing sugar
- 20 g of strawberry jam.

In your local shop the ingredients you require are available in the following portions:

200 g of butter = £1.00 and is buy one get one free

70 g of caster sugar = £1.20 or 50 g = £1.00

6 eggs = £1.00

35 g of flour = 40p and is 4 for the price of 3

100 ml of milk = 20p

70 g of icing sugar = 55p

10 g of strawberry jam = £1.50 or 5 g is 95p.

You will aim to spend the minimum possible to get all of the ingredients you need

When paying for your ingredients at the shop you are given £8.50 change from your £20.

Before you begin preparing your meal you must measure out the required amounts of each ingredient from what you have purchased.

The task:

A1. Identify the mathematical problems you will face to successfully gather the ingredients for your cake

A2. Using the information provided identify the number of portions of each ingredient you need to buy from the shop

A3. Calculate how much you will spend buying all of the ingredients required

A4. Check you have been given the correct amount of change, stating the correct amount that should have been given if incorrect

(Please show your working below)

(Please show your working below)

Working with measurement
Section A: Be able to work with time in different formats

A.1 Write down the following items in 24 hour clock format:

(a) quarter to four in the afternoon

(b) twenty five minutes past ten in the morning

(c) ten past eleven in the evening

A.2 A train leaves at 22.35 and arrives at its destination at 23.55. How long has the journey taken?

A.3 Andy arrives at work at 8.35 am and leaves at 2.00 pm. Write these times in 24 hour clock format and calculate how long Andy is at work.

A.4 Write the following dates in numerical format:

(a) 12th June twenty thousand and fourteen

(b) 9th May nineteen hundred and seventy five

A.5 A meal is placed in a pre-heated oven at 18.45. The meal needs to cook for 25 minutes. When should the meal be taken out of the oven? (Write your answer in 24 hour clock time)

A.6 Calculate the number of days for each of the periods given below:

(a) 13 July to the 26 August

(b) 11 December to 4 January

A.7 The time showing on a clock at the start of a meeting is:

When the meeting ends the clock shows:

How long did the meeting last?

A.8 A film lasts for 115 minutes. How long is this in hours and minutes?

A.9 A man has to take a course of medicine for 3 days. How many hours is this?

A.10 A woman runs a race in 2 minutes and 15 seconds. How long is this in seconds?

A.11 When a microwave oven is set to cook for 4 minutes the display shows 4:00. The display then counts down the time after the cooking starts.

What will the display show after one minute and 30 seconds of cooking?

A.12 A woman swims for 35 minutes every morning.
When she starts swimming a clock shows the time as

At what time should she stop swimming?

Section B: Be able to work with different units of measurement

B.1 How many metres are there in 7 kilometres?

B.2 A block of stone weighs 4000 kg.
What is this weight in metric tonnes?

B.3 A man consumes a total of 3750 ml of orange juice in one month.
How much is this in litres?

B.4 A gap in a wall is 3 feet wide. How wide is the gap in inches?

B.5 A gardener collects rainwater in a water butt with a capacity of 4 gallons.
How many pints does it hold?

B.6 A recipe requires 24 ounces of flour. How many pounds is this?

B.7 For this question, use the conversion factor 1 ft = 30.48 cm

A picture frame is 4 feet wide. What is this width in centimetres? You may give your answer to the nearest whole number.

B.8 For this question, use the conversion factor 1 gallon = 4.546 litres

A farmer fills a 5 gallon can with diesel.

How many litres will it contain? You may give your answer to the nearest whole number.

B.9 For this question, use the conversion rate 1 lb = 453.592 g

A chef prepares 4 steaks weighing a total of 3 lb.
What is the total weight in grams? You may give your answer to the nearest whole number.

B.10 Give the conversions between the units below.

(a) 1 metre = cm

(b) 1 kilometre = m

(c) 1 kilogram = g

(d) 1000 ml = l

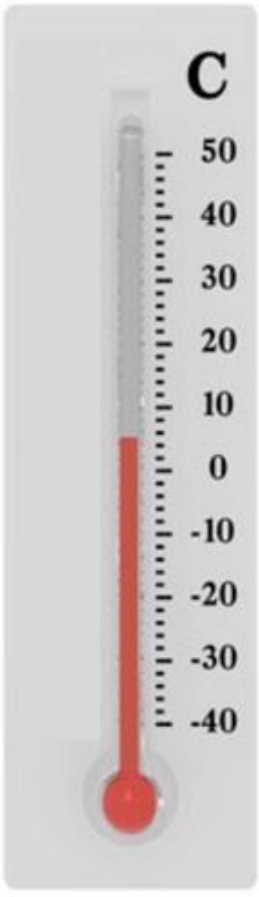
(e) 1 foot = ins

(f) 1 pound = oz

(g) 1 stone = lbs

(h) 1 yard = ft

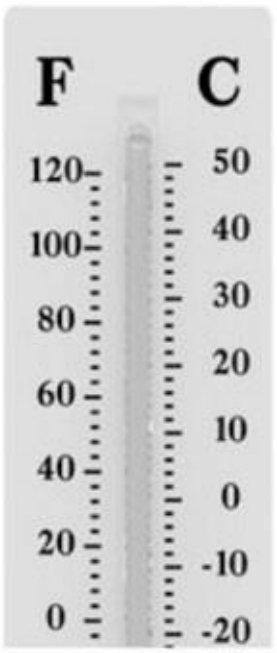
B.11 What is the temperature shown on this thermometer?



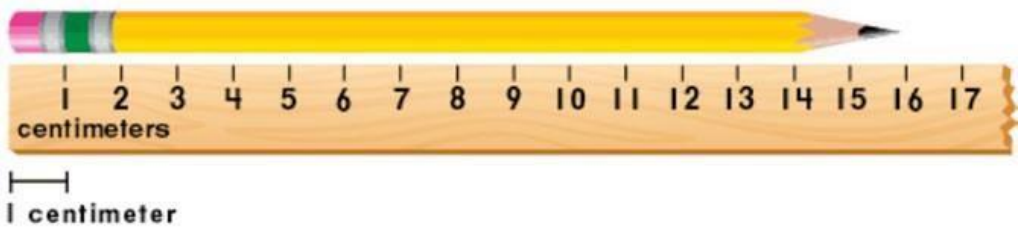
˚C

B.12 A temperature is recorded as 60 °F. Use the temperature scale below to state the closest temperature to this in °C. Give your answer to the nearest whole number.

˚C

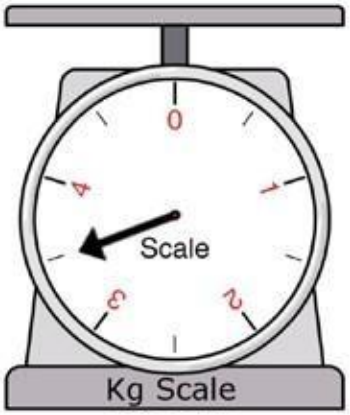


B.13 How long is the pencil?



B.14 What is the weight shown on these scales?

kg



Section C: Be able to find measurements of regular shapes from given formulae

C.1 A rectangle has a length of 3.15 m, a width of 2750 mm. What is the perimeter of the rectangle in metres?

C.2 A cuboid has a height of 25 mm, a length of 2 cm and a width of 2 cm. What is the volume of the cuboid in cm^3?

C.3 Work out the circumference of a circle that has a radius of 14 cm. Give your answer to the nearest whole number.

C.4 A regular octagon has sides that are 16 cm long. What is the perimeter of the octagon?

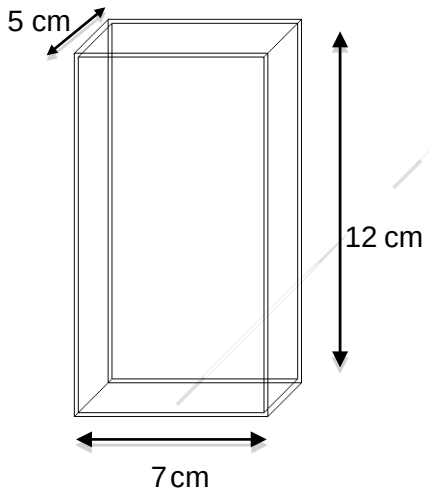
C.5 Express pi (π) as a fraction

C.6 Write pi (π) to 2 decimal places.

C.7 Work out the circumference of a circle with a diameter of 10 cm. Give your answer to the nearest whole number.

C.8 A circle of radius 7 m is being painted on a playground. Work out the area of the circle. Give your answer to the nearest whole number.

C.9 Calculate the volume of the rectangular box:

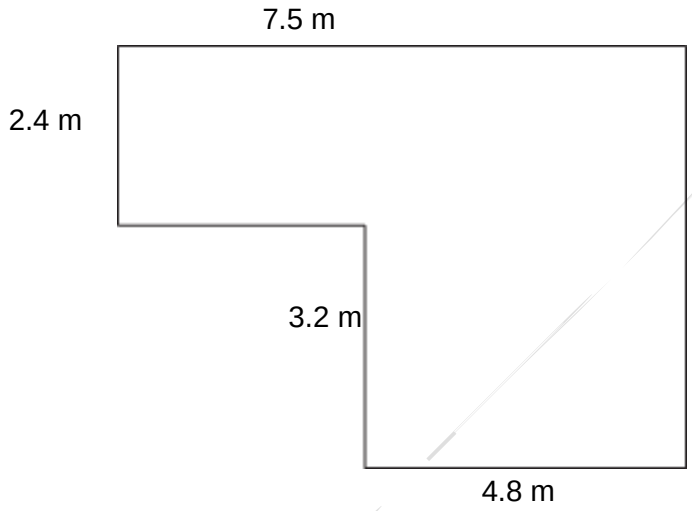


C.10 What is the volume of a can that has a radius of 10 cm and a height of 25 cm?

C.11 What is the volume of a can that has a radius of 7 cm and a height of 10 cm?

C.12 The plan shows the dimensions of a living room floor. (All the angles are right-angles)

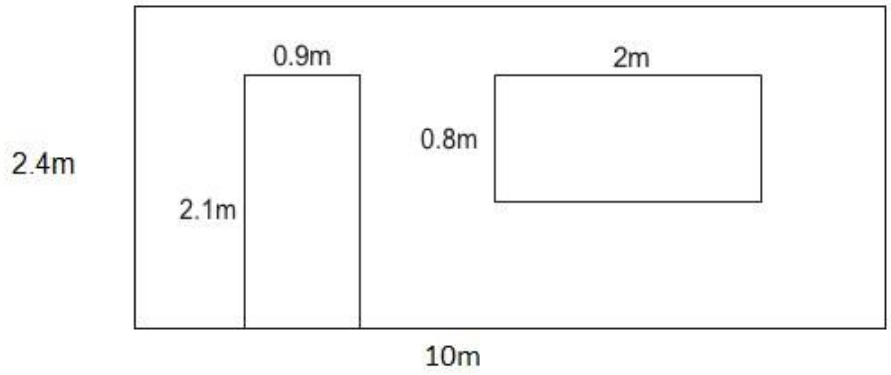
What area of carpet is needed for this floor?



C.13 The diagram below shows the wall of a house that is to be painted.

All the shapes are rectangular.

The window and the door do not need to be painted. What area of wall needs to be painted? Show your workings



C.14 A cardboard box is 1.2 m long, 20 cm wide and 5 mm high. Write all the dimensions in mm. Then calculate the volume of the box. (Volume = length x width x height)

Length = mm

Width = mm

Height = mm

Volume = mm^3

Section D: Be able to calculate using sums of money

D.1 In a sale a radio that cost £56 was reduced by 10%. How much was the sale price? Show your working.

D.2 Add 20% VAT to £30.50. Show your working.

D.3 Calculate the simple interest on £1200 for two years at 5% per annum. Show your working.

D.4 Anton paid 8% interest on a bank loan of £280.50. How much interest did he pay? Show your working.

D.5 12.5% per annum simple interest is paid on £240.00 for 6 months. How much interest is paid? Show your working.

D.6 After a 15% discount a coat cost £161.50. How much was the coat before the discount? Show your working.

D.7 Angie invested some money at 5% simple interest. After two years she had £594. How much did she invest? Show your working.

D.8 Sunil bought a car for £800 and sold it for £1000. What percentage profit did he make? Show your working.

D.9 If £1 = $1.5 how many dollars would £342.00 be worth?

D.10 How many euros would you get for 2000 Australian dollars if one Australian dollar is worth 0.65 euros?

D.11 You get 3.8 zloty to a euro. How much would you get for 532 zloty in euros?

D.12 If 1152 rupees are worth 400 rubles what is the exchange rate?

D.13 A pound is worth 1.1783 euros. Round the exchange rate to the one decimal place to estimate the value of 480 euros to the nearest pound.

(a) £400
(b) £576
(c) £436
(d) £528

Working with probability
Section A: Understand the key terms and methods used in probability

A.1 Briefly explain what is meant by ‘probability’

A.2 Which **one** of these is **not** correct?

(a) Probability can be from 0% to 100%
(b) A probability can be any number greater than 0
(c) Something that is certain has a probability of 1
(d) Probability is a number that indicates the chance of something happening

A.3 Describe why the toss of a coin is considered an ‘independent event’

A.4 Describe why picking cards from a deck is considered a ‘combined event’

A.5 A fair 12sided die is thrown. It has the numbers one to 12 on its faces. Which of these pairs of events is mutually exclusive?

(a)	An odd number	A number less than 7
(b)	A 3 or a 4	An odd number
(c)	A number greater than 6	An even number
(d)	A number less than 9	A two digit number

A.6 A fair spinner has numbers 1, 2, 3, 4. It is spun twice

(a) List all the possible outcomes of two spins.

(b) How many outcomes have both numbers the same?

A7. Two six-sided die are thrown to get a score. If the numbers are the same, the sum of the two numbers is scored. If they are different the larger number is scored

(a) Complete this table of possible outcomes.

		Second die					
		1	**2**	**3**	**4**	**5**	**6**
First die	**1**	1	2	3	4	5	6
	2	2	4	3	4	5	6
	3	3	3	6			6
	4	4	4	4			6
	5	5	5	5			6
	6	6	6	6	6	6	12

(b) What is the probability of throwing a one with the first die?

(c) What is the probability of scoring 3?

(d) If the first die is a 2 what is the probability of scoring 4?

A8. The following table shows the probabilities of a five-sided spinner landing on Red, Yellow, Green, Blue or Pink:

Colour	Red	Yellow	Green	Blue	Pink
Probability	0.2	0.2	0.2	0.2	0.2

Is the spinner fair? Yes/No

Section B: Analyse a probability problem

B.1 Describe an instance when you might come across probability

B.2 You have bought a multipack of crisps which contains:

- 5 x cheese and onion
- 3 x ready salted
- 2 x salt and vinegar

(a) Populate the grid below to show what the probability is of getting each flavour when picking a bag at random

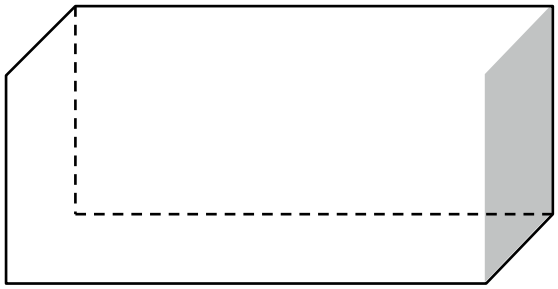
Flavour	Probability
Cheese and onion	
Ready salted	
Salt and vinegar	

(b) What is the probability of getting a bag of cheese and onion and then a bag of ready salted? Express your answer as a number and to 2 decimal places

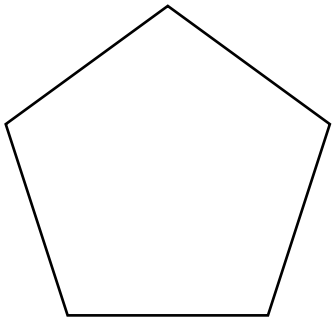
(c) What is the probability of getting 2 bags of salt and vinegar in a row? Express your answer as a fraction

Working with 2D and 3D shapes and space
Section A: Know how to use common 2D representations of 3D shapes

A.1 How many faces does this solid cuboid shape have?



A.2 How many lines of symmetry does a regular pentagon have?

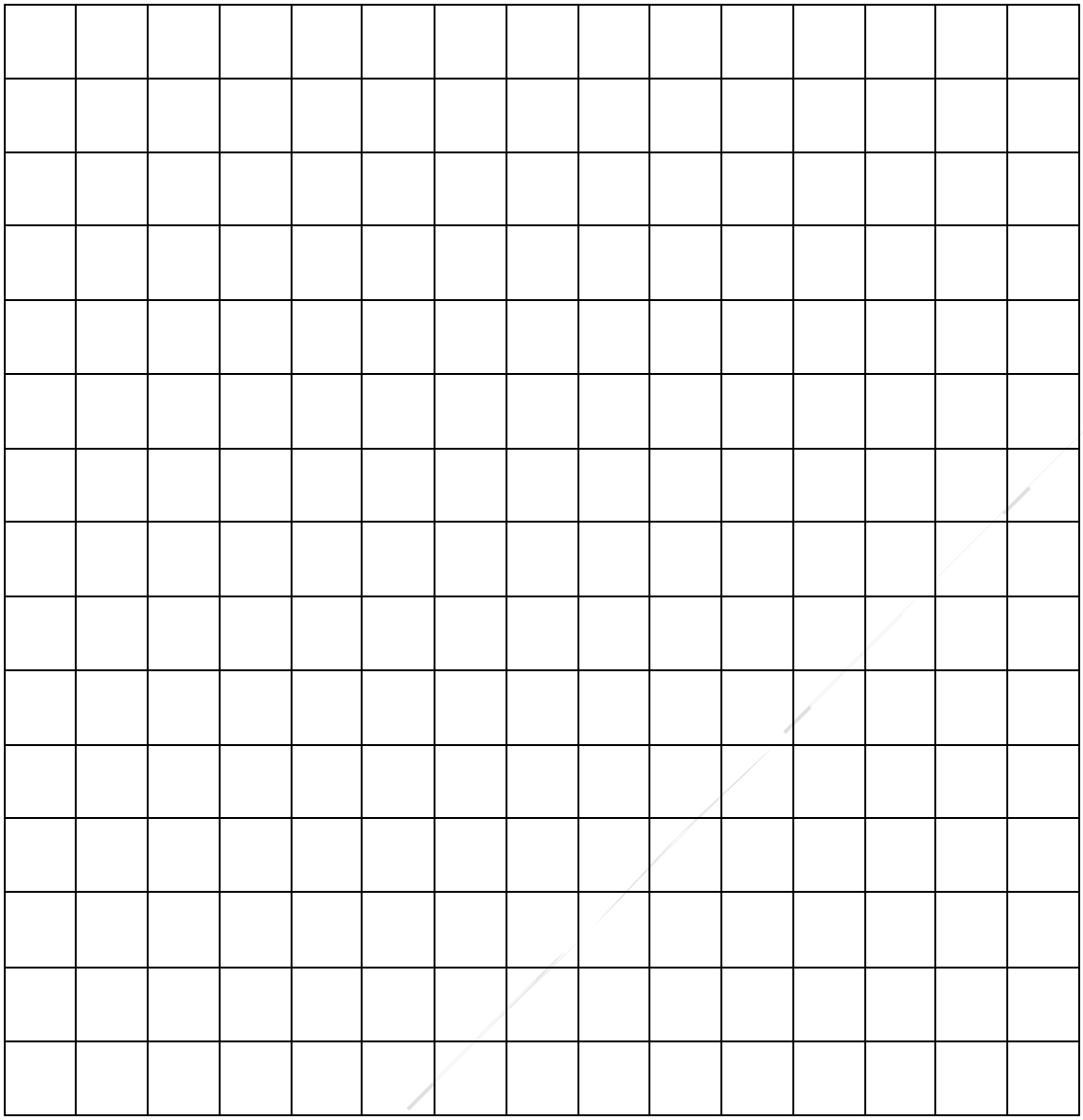


A.3 Identify the shapes from their descriptions.

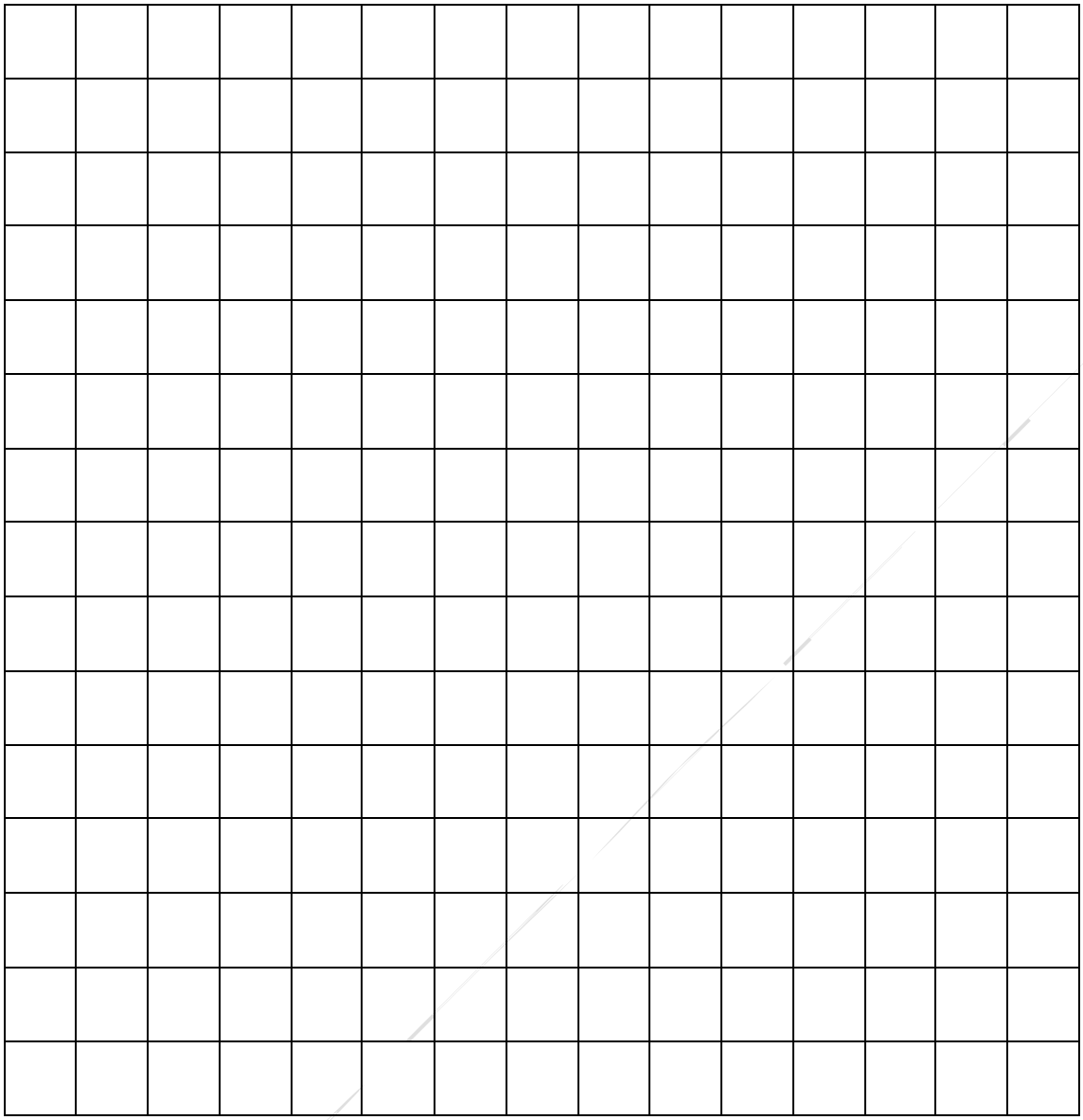
(a) Four sided, 2 dimensional figure with opposite sides the same length and 4 right angles
(b) A 2 dimensional figure with eight equal length sides
(c) A 3 dimensional object with 4 triangular faces and a square base
(d) A 3 dimensional object with six faces whose edges are all the same length

A.4 Explain how a cuboid could be represented using a 2D image.

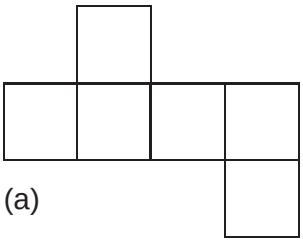
A.5 Shade in squares to show the net of a cuboid.



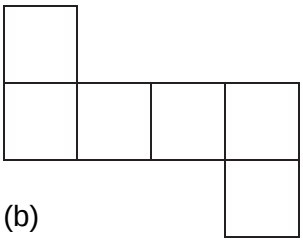
A.6 Shade in squares to show the net of a prism



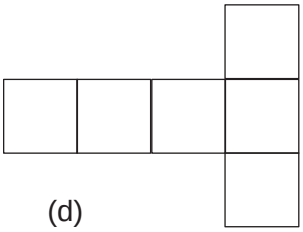
A.7 Which of the following nets is not a 2D representation of a cube?



(a)



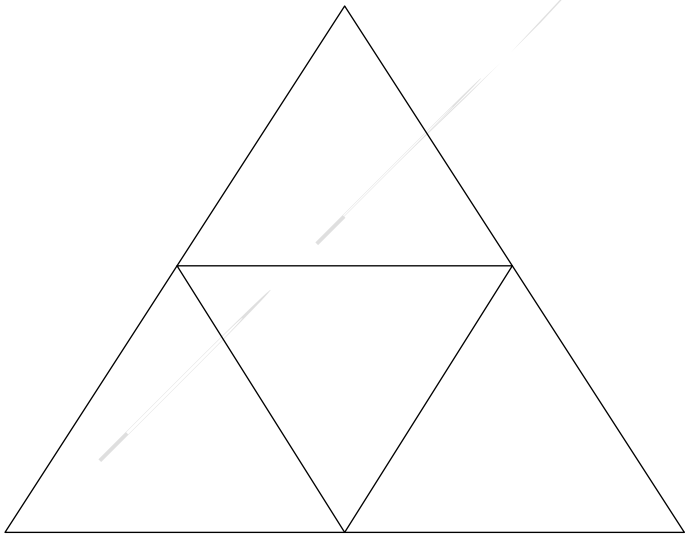
(b)



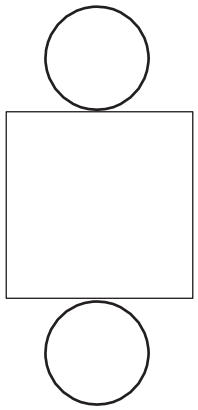
(c)

(d)

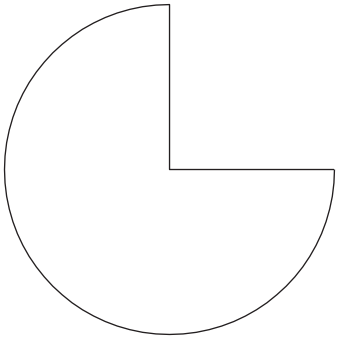
A.8 This is a net of a 3D object. What object is it?



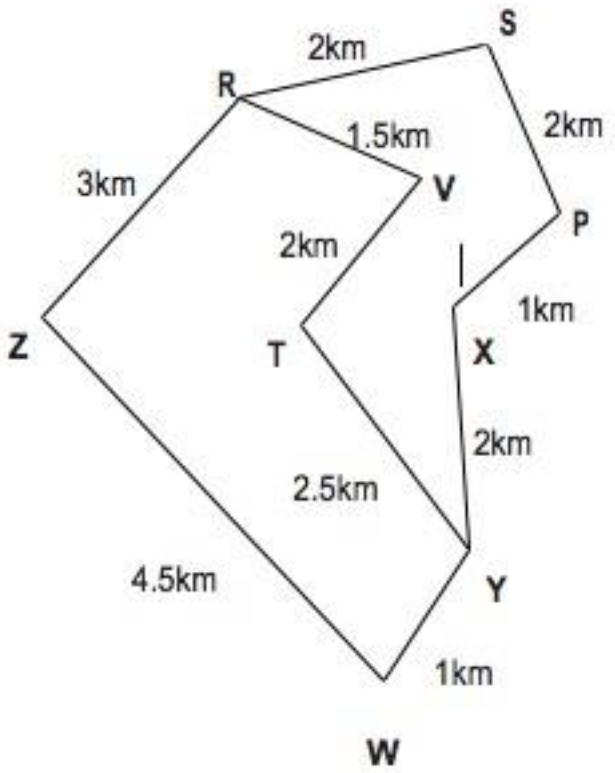
A.9 This is a net of a 3D object. What object is it?



A.10 This is a net of a 3D object. What is the object?



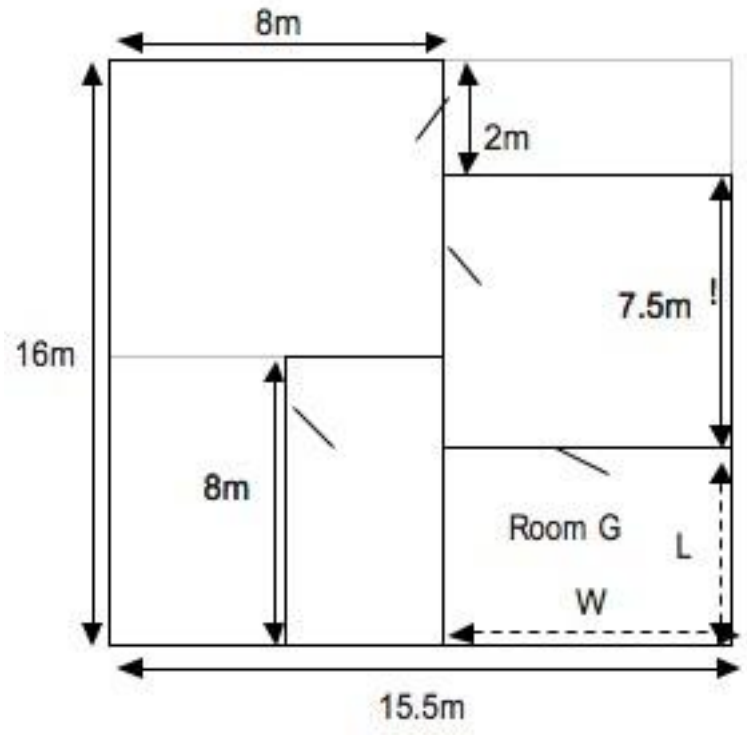
A.11 This map shows roads connecting a number of towns.



Which route from R to W is the shortest distance?
Use the letters to describe the route.

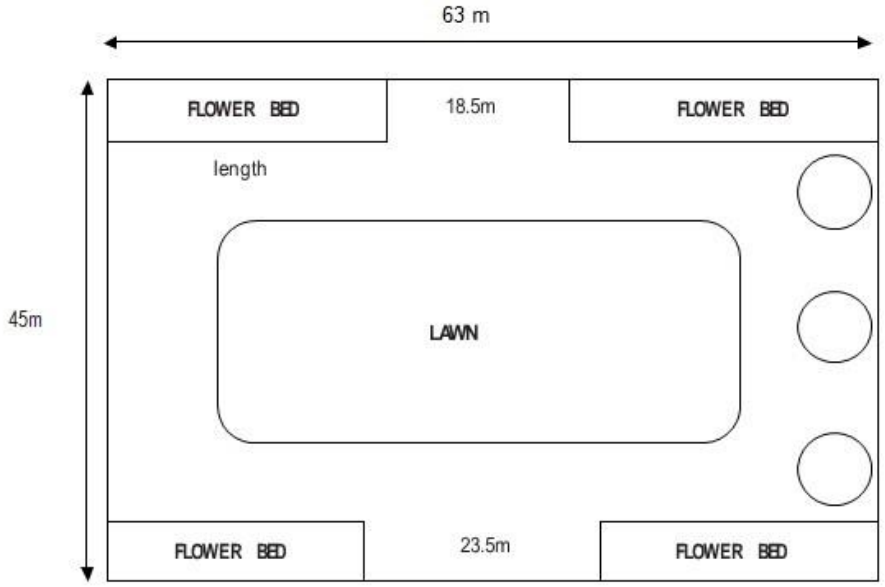
How long is the distance?

A.12(a) The diagram shows the plan of an apartment. What are the dimensions of room G?



A.12(b) If the room is 2 m in height, what is the volume of the room in m^3?

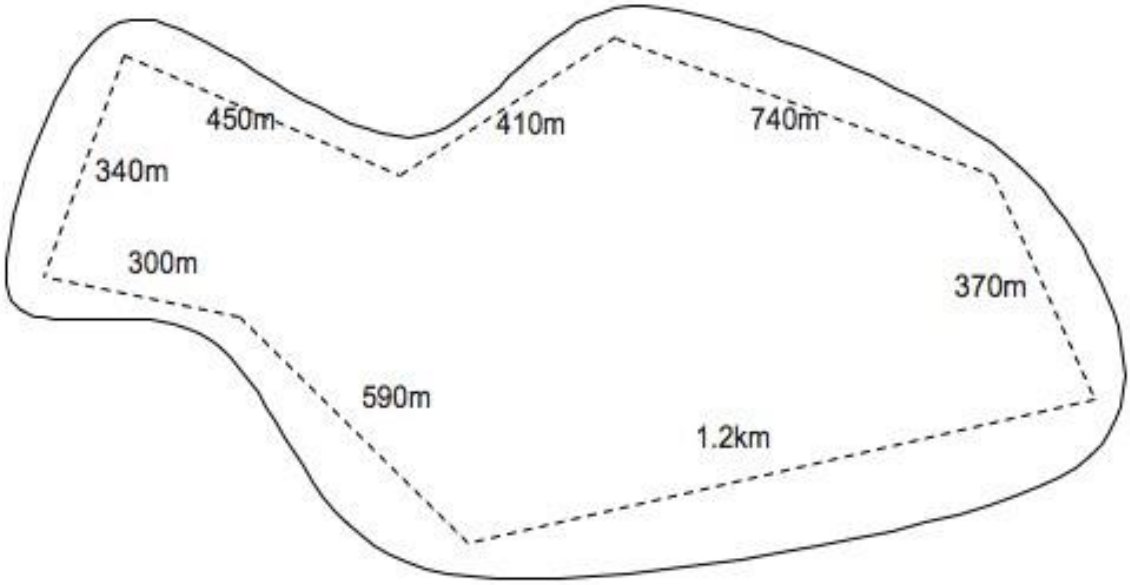
A.13 The plan shows the details of the lawn and flower-beds in a rectangular walled garden.



What is the total length of all the flower beds?

Answer m

A.14 The plan of a common shows the route for walkers.



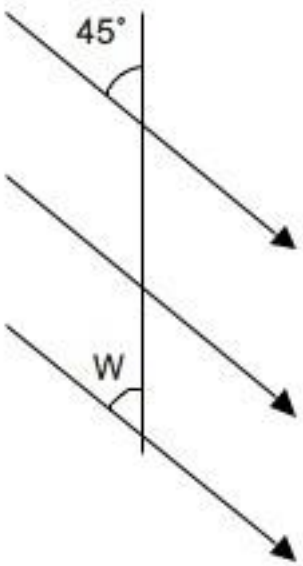
What is the total length of the route? Give your answer in kilometres.

Answer km

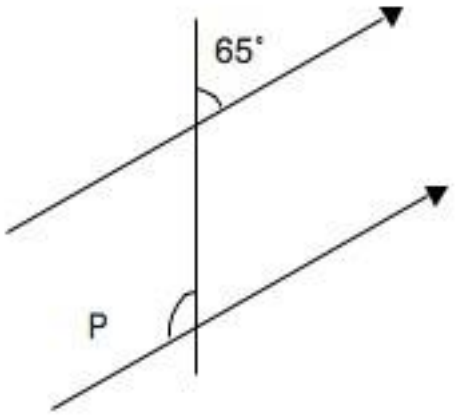
Section B: Solve problems involving 2D shapes and parallel lines

B.1 Explain what is meant by parallel lines.

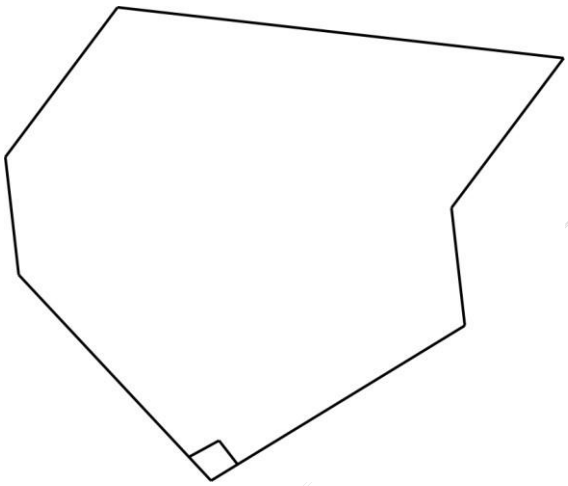
B.2 Look at the intersecting lines below. What is the size of angle W?



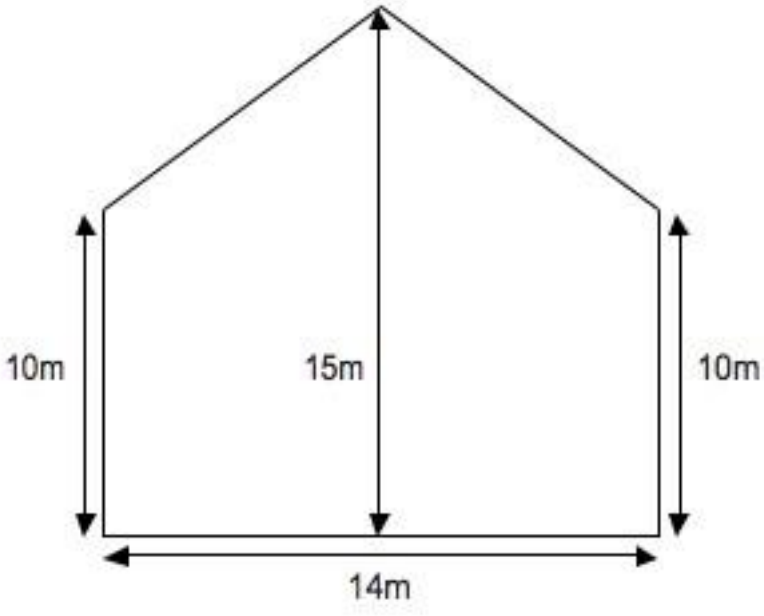
B.3 Look at the set of lines below. What is the size of angle P?



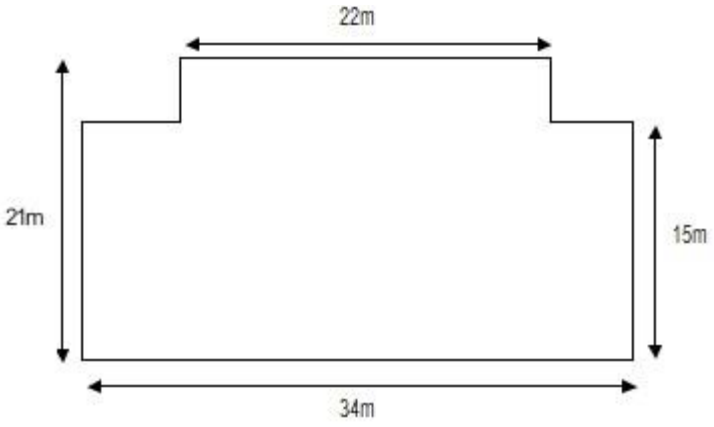
B.4 An irregular shape is being used for a design. Draw two parallel lines in the diagram to divide the shape into two parallelograms and a right-angled triangle.



B.5 An irregular shape is being used for a design. Calculate the area of the shape. Show your workings

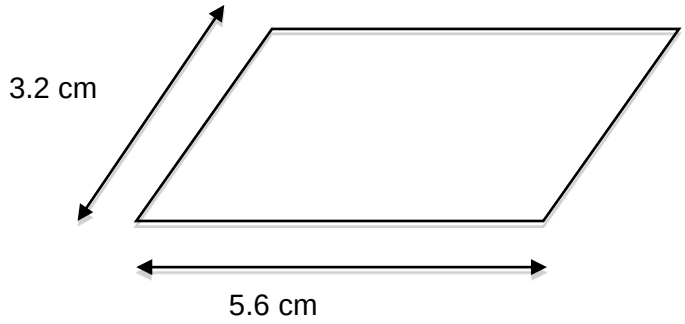


B.6 An irregular shape is being used for a design.



Calculate the area of the shape. Show your workings. m^2

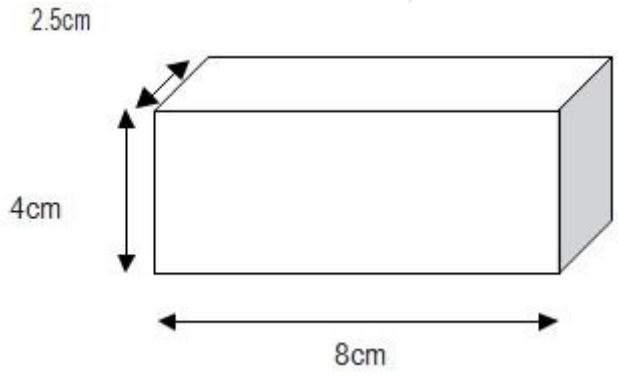
B.7 Look at the scale drawing of the parallelogram and calculate the actual perimeter.



Scale 1:25

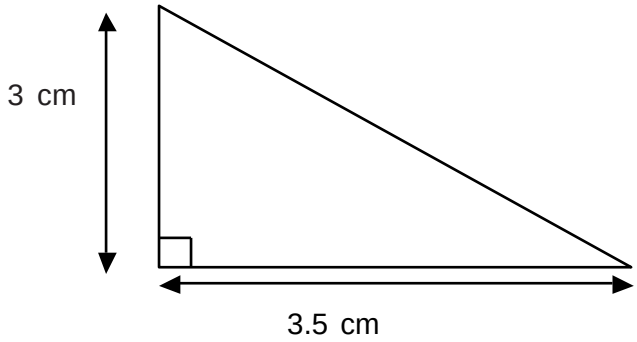
The actual perimeter

B.8 Look at the scale drawing and calculate the actual volume of the box.
Scale 1: 6



B.9 Scale drawing. Calculate the actual area of the right angled triangle.

Scale 1:20



Working with statistics
Section A: Know how to work with discrete and continuous data

A.1 Explain the difference between discrete data and continuous data.

A.2 Which of the following is an example of discrete data?

(a) shoe size
(b) length of left foot
(c) height
(d) weight

A.3 Which of the following measurements for a car are continuous?

(a) the number of wheels
(b) the number of seats
(c) the amount of fuel in the tank
(d) the number of doors

A.4(a) Give a reason why continuous data can be difficult to work with.

A.4(b) Give an example of when this problem might occur.

A.5 Give two reasons why a scale is used in a graph.

1.
2.

A.6 The costs of a week's accommodation in a hotel are shown in the table.

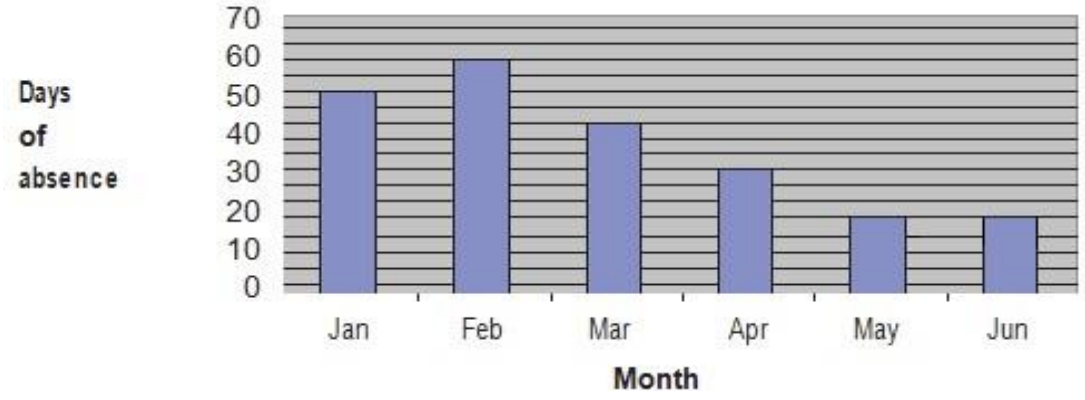
Week beginning	1 April	8 April	15 April	22 April	29 April
Single room (£)	210	250	230	270	300
Double room (£)	350	390	370	410	440

How much would it cost for one double room and two single rooms for the week containing April 17?

£

A7. A company keeps a monthly record of its workers' absence figures.

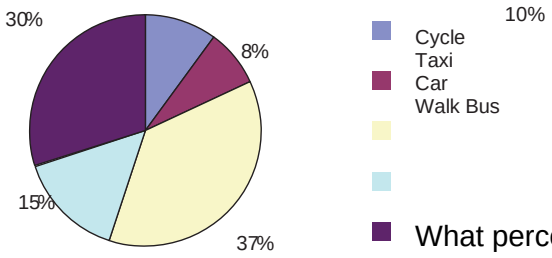
The results for the first 6 months of a year are shown below.



What is the difference between the highest and lowest monthly totals?

days

A.8 The results of a survey into the ways students travel to college are shown on a pie chart.



What percentage of students walk or cycle to college?

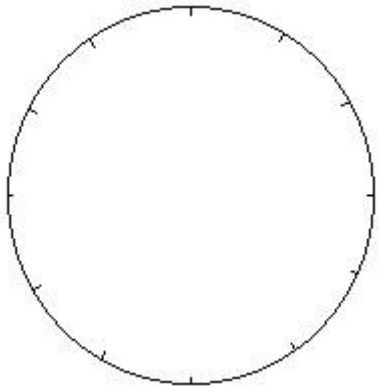
A.9(a) A shopkeeper surveys the age of the first 12 customers who enter her shop. The ages are:

16, 33, 40, 54, 41, 19, 26, 37, 59, 59, 23, 69

Enter these results in the table below.

Age of customer	15–25	26–35	36–45	46–55	56–75
Frequency					

A.9(b) Complete this pie chart using data from the table you have just completed:



A.10 Darshit records his weight using the table below.

Month	April	May	June	July	August
Weight (kg)	67	68	67	66	64

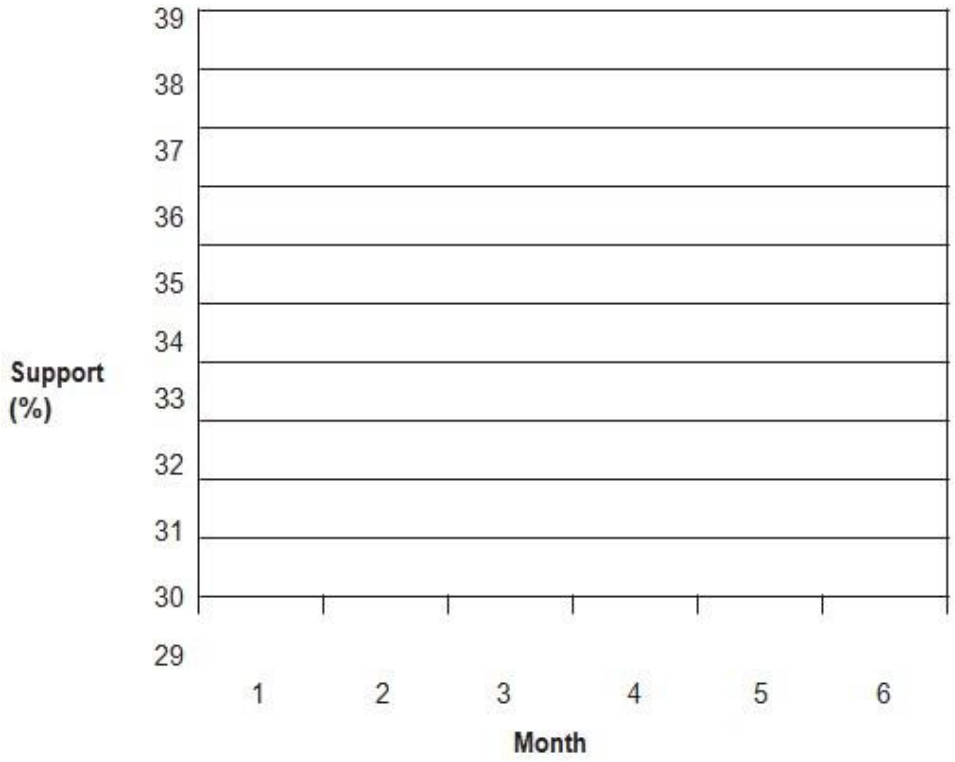
Use the space below to represent this data in the form of a line graph.

A.11 A survey is conducted of the percentage support given to a political party every month over a 6-month period.

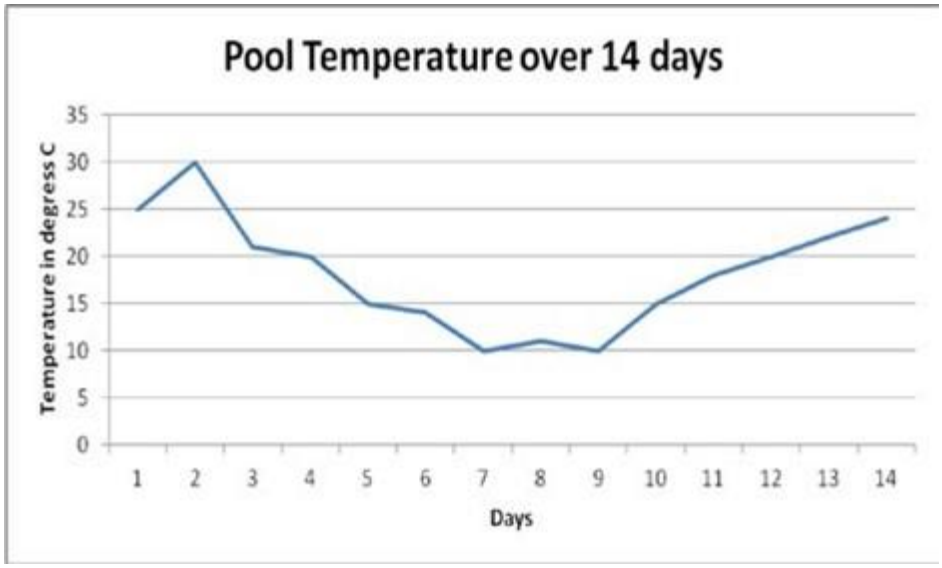
The results are shown in the table.

Month	1	2	3	4	5	6
Percentage	32	33	32	35	38	37

Draw the results as a line graph on the grid below.



Questions A12 and A13 are about this graph



A.12 On which day was the highest temperature recorded?

A.13 What temperature is recorded on day 7?

Section B: Find averages to compare two data sets

B.1 Explain the difference between the mean, median and mode

B.2 A group of 7 boys is arranged in a line according to height. The height of the 4th boy in the line is the ....

(a) mean height of the group
(b) median height of the group
(c) modal height of the group
(d) range in height of the group

B.3 A group of girls is asked to name their favourite singers.
The most popular name is the ....

(a) mean
(b) median
(c) mode
(d) range

B.4 A man records the midday temperature every day for a week. He then totals the temperatures and divides by 7.

The figure he produces is the ...

(a) mean temperature
(b) median temperature
(c) modal temperature
(d) range of temperature

B.5 A die is rolled 50 times. The results are shown in the table

Score	1	2	3	4	5	6
Frequency	9	9	7	8	10	7

What is the mean score of all 50 rolls, to 2 decimal places?

B.6 The mean house prices for each quarter of 2012 are shown below.

Quarter	1	2	3	4
Mean price (£)	178 396	179 334	180 203	182 467

What is the mean price overall for 2012?

£

B.7 A golfer's scores for the past 20 rounds are shown below.

79 79 83 84 81 72 81 74 81 80
79 71 81 83 87 81 92 70 69 82

What is the golfer's modal score for these rounds?

B.8 The ages, in years, of a firm's sales team are:

27, 23, 21, 19, 37, 43, 25, 39, 51, 33

What is the median age of the team?

years

B.9 The salaries earned a by firm's workers are shown in the table.

Salary (£)	15 000	20 000	30 000
Number of staff	10	1	1

Which of these averages would be the highest for this firm?

(a) the mean
(b) the median
(c) the mode

Section C: Describe the spread within sets of data

C.1 Explain what is meant by the range of a set of data

C.2 The scores obtained in a test by a group of students was:

46, 53, 87, 28, 49, 37

What is the range of scores?

C.3 Nine games of football were played. The table below shows the number of goals scored in each game.

Game	1	2	3	4	5	6	7	8	9
Goals scored	2	1	2	7	3	3	1	3	1

What is the range of goals scored?

C.4 A manager is comparing the performance of four delivery firms.
The times taken for their last deliveries are shown below.

	Number of days before delivery arrived							
Firm	1	2	3	4	5	6	7	8
A	1	1	1	5	2	1	2	1
B	2	1	1	2	4	2	1	4
C	1	2	3	4	1	4	6	8
D	1	8	1	1	2	2	9	1

C.4(a) What is the range of delivery times for each firm?

A B C D

C.4(b) Which firm had the shortest range of delivery times?

Working with whole numbers
Section A: Compare positive and negative numbers

A.1 Sally's bank account has a balance of -£345.00. She pays in £500. Explain the difference between her original and her new balance.

A.2 In the number 365 243, what is the value of the digit '5'?

(a) 50 000
(b) 5 000
(c) 500
(d) 50

A.3 In the number 675 900, what is the value of the number 9?

(a) 9 000
(b) 900
(c) 90
(d) 9

A.4 Write each of these lists of numbers in order from smallest to largest.

(a) 2, -2, 22, -12
(b) -29 990, -29 900, -30 200, -30 001
(c) -456, -465, 456, 465
(d) -234, -1234, 1234, -12345

Section B: Carry out calculations

B.1 Define the following mathematical terms:

(a) multiple
(b) factor

B.2 Which of these numbers is a factor of 10?

(a) 2
(b) 6
(c) 15
(d) 20

B.3 Which of these numbers is a multiple of 10?

(a) 2
(b) 6
(c) 15
(d) 20

B.4 What is $\frac{154}{7}$ + 5?

B.5 What is 33 × 6?

B.6 Cinema tickets cost £13 for adults and £8 for children. How much cash would be needed to pay for a group of 2 adults and 3 children after using a single £5 voucher?

B.7 The distance from Bristol to Bath is 11 miles and the distance from Bath to Chippenham is 14 miles. If you drive from Bristol to Chippenham via Bath and back via Bath each day, how many miles have you driven in a 5 day week?

B.8 Three classes, containing 24, 28 and 22 students, are going on a school trip. How many 15 seater mini buses will be needed to carry the students?

B.9 Write the number 12 as a product of prime factors.

B.10 Write the number 26 as product of prime factors.

B.11 Write the number 42 as a product of prime factors.

B.12 List the prime numbers up to 20:

Section C: Calculate ratio and direct proportion

C.1 The ratio of women to men in an evening class is 4:3. If there are 12 women how many men are there?

C.2 A recipe says to add 3 parts water to 2 parts milk. If 120 ml of milk is added, how much water should be added?

C.3 The takings from an event are to be split between the venue and the organiser in the ratio 5:3. If the takings are £584 how much does the organiser receive?

£

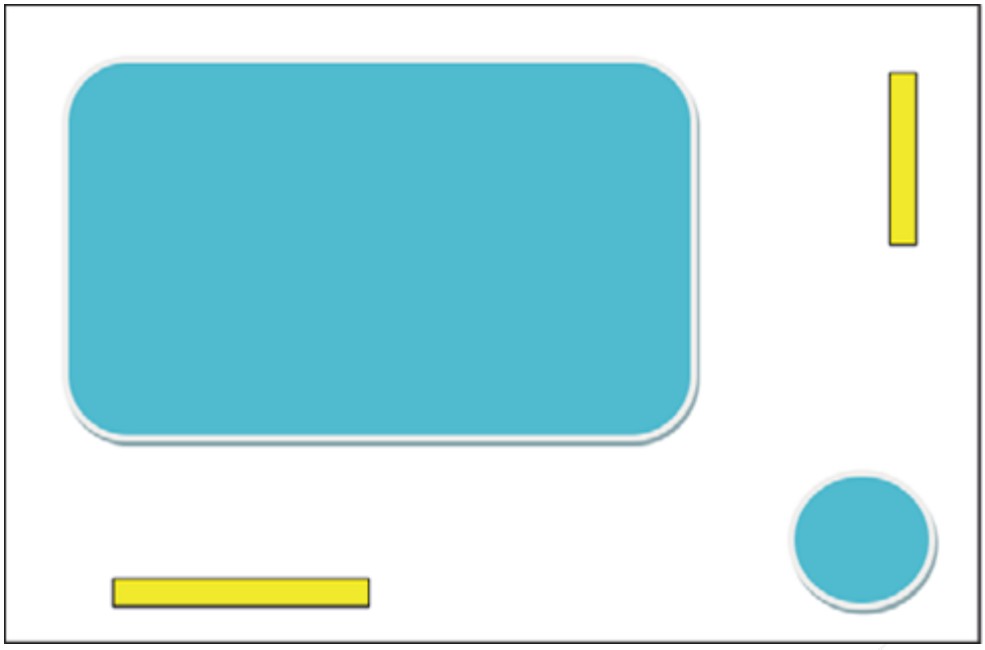
C.4 A recipe for pancake mixture says to use flour and milk in the ratio 3:2. To make 15 cups of the mixture, how many cups of flour should be used?

cups

C.5 A book of 8 stamps costs £4.80. How much do 5 stamps cost?

C.6 A recipe for 4 people uses 500 g chicken. How much chicken is needed to serve 6 people?

Questions C7 and C8 refer to the following plan. You will need a ruler to complete these questions.



Scale 1 : 200

C.7 What is the length of the swimming pool? Give your answer in metres.

C.8 What is the width of the swimming pool? Give your answer in metres.

Section D: Work with expressions

D.1 To convert from Celsius to Fahrenheit you use this formula: $\frac{9}{5}$ C + 32 = F where C is the temperature in degrees Celsius and F is the temperature in degrees Fahrenheit

What is 20 degrees Celsius in degrees Fahrenheit?

degrees Fahrenheit

D.2 Gas charges are calculated using this formula:

Cost of gas = (number of units × cost per unit) + standing charge

If the number of units used is 18, the cost per unit is £2 and the standing charge is £6, what is the cost of the gas?

£

D.3 Which of the following is correct?

(a) ab = a multiplied by b
(b) ab = a minus b
(c) ab = a plus b
(d) ab = a multiplied by a

D.4 Explain the purpose of the brackets in the formula below.

a = 6(4+b)

D.5 a(b+5) is the same as:

(a) b + 5 divided by a
(b) b + 5 multiplied by a

D.6 Which of these is another way of writing the formula 2(a+b)+1?

(a) 2a+b+1
(b) 2a+2b+2
(c) a+2b+2
(d) 2a+2b+1

D.7 Evaluate 3(a+b-2), where a = 3 and b = 4

D.8 Evaluate $\frac{1}{2}$ (d - 10), where d=16

D9. Convert the following words into algebraic expressions. The first one has been done for you.

y less 14	y – 14
a multiplied by 4	
4 less than the sum of x plus y	
n multiplied by x	

D10. Convert the following algebraic expressions into words. The first one has been done for you.

a + b	a plus b
xy	
4b + 7	
16 - x	

END OF PAPER

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