NCFE

NCFE Level 2 Functional Skills Qualification in Mathematics (603/5060/X)

| Paper number: | P001441 |
| Section B: | Calculator Test |

Time allowed: 1 hour 30 minutes

Learner instructions
- Answer **all** questions.
- Read each question carefully.
- Write your answers in the spaces provided.
- Show your working, as marks may be awarded for working.
- State units in your answers, where appropriate.
- Check your work.
- Use π = 3.14

Learner information
- Section B contains **Activities 2, 3** and **4**.
- The maximum mark for this section is **45**.
- The marks available for **each** question are shown in brackets.

Resources
You will need a:
- pen, with black or blue ink
- pencil and eraser
- 30 cm ruler
- pair of compasses
- calculator.

If extra pages are used, please make sure your name and centre name are on them and they are securely fastened to this booklet.

Please complete the details below clearly and in BLOCK CAPITALS.

Learner name

Centre name

Learner number

Centre number

Do not turn over until the invigilator tells you to do so.

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Activity 2: Water savings

2 (a) Kamrul wants to reduce the amount of water he uses at home.

He uses the kitchen tap for 350 days a year for 20 minutes each day.

The flow rate of his kitchen tap is 5.5 litres per minute.

Kamrul wants a new kitchen tap with a flow rate of 4.7 litres per minute.

He thinks he can save more than 6000 litres of water in a year if he uses the new kitchen tap for 350 days a year for 20 minutes each day.
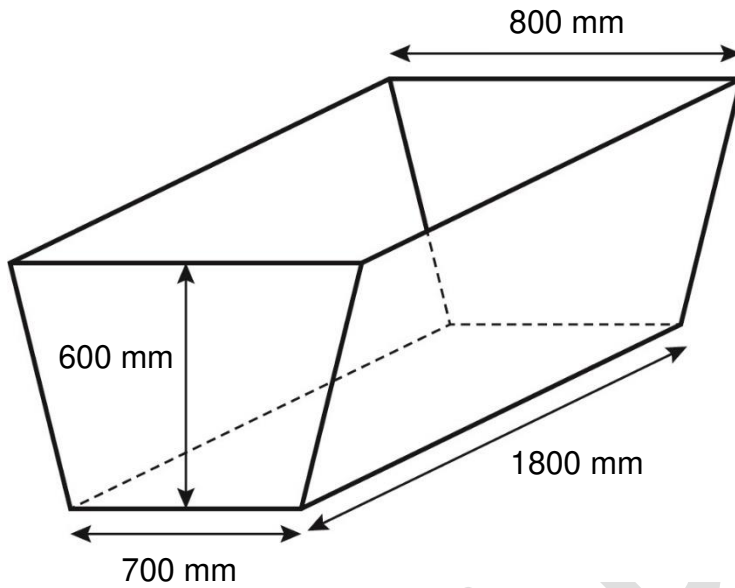
Is Kamrul correct?

Show how you decide.

[2 marks]

Your answer:

Please turn over

3

2 (b)   The diagram shows Kamrul's bathtub.

The bathtub is a prism with a cross section in the shape of a trapezium.

800 mm

**Not drawn
accurately**

600 mm

1800 mm

700 mm

Kamrul uses this formula to calculate the capacity of this prism:

$C = 0.5h(a + b)L$

Where:

C = capacity of the prism
a = width of the bottom edge of the trapezium
b = width of the top edge of the trapezium
h = height of the prism
L = length of the prism

Kamrul normally fills the bathtub with water to 78% of its capacity.

He thinks that, if he fills the bathtub to 72% of its capacity, he will save more than 40 litres of water.

Is Kamrul correct?

Show how you decide.

[5 marks]

Your answer:

2 (c) Kamrul wants to wash his car.

He knows it takes 120 litres of water to wash a car in a car wash.

Kamrul decides to hand wash his car.

He fills up a 3-gallon bucket six times to wash his car.

What percentage of 120 litres does Kamrul save?

Use the conversion: 1 gallon = 4.55 litres

[3 marks]

Your answer:

%

2 (d) Kamrul looks at his quarterly water bill.

Total volume of water used this quarter: 118 m³

This is 23% less than the same quarter last year.

Work out the volume of water Kamrul used for the same quarter last year.

Give your answer to 1 decimal place.

[2 marks]

Your answer: **m³**

Please turn over

2 (e) The water company needs to reduce water leakage.

This data shows the volumes of water leaked in 2019:

Water leaked (millions of litres per day)	Number of days
0 ≤ w < 200	87
200 ≤ w < 400	105
400 ≤ w < 600	153
600 ≤ w < 800	20
Total	365

Use the data to work out an estimate of the mean amount of water leaked per day.

Give your answer to the nearest whole number.

[3 marks]

Your answer: **millions of litres per day**

[Total marks: 15]

Activity 3:   Music festival

3 (a)   Pavel organises a music festival.

He puts this information on the festival's website:

"Four million, nine hundred and eight thousand, six hundred and thirty people attended our festival over the last 30 years".

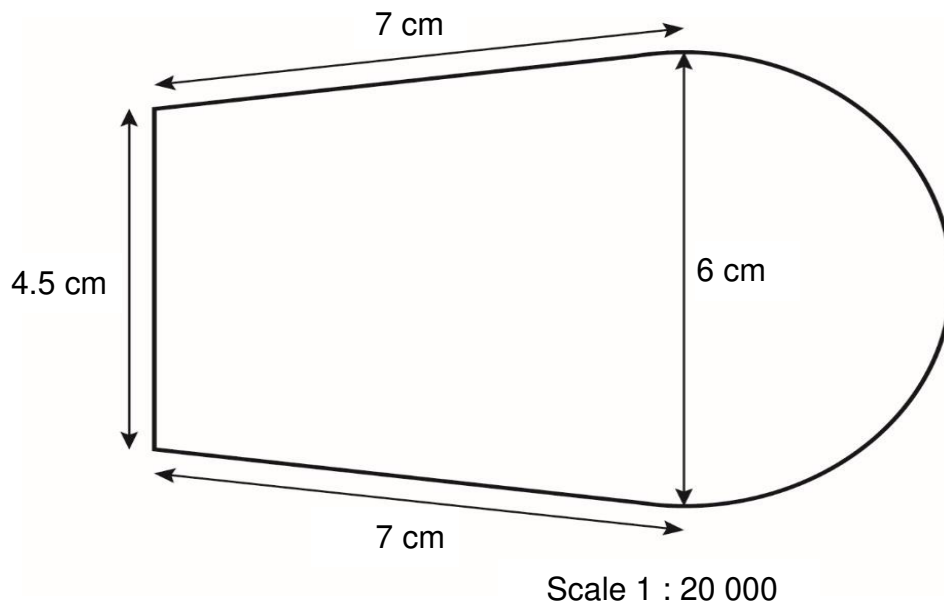Write four million, nine hundred and eight thousand, six hundred and thirty as a number.

[1 mark]

Your answer:

Please turn over

3 (b)   Pavel has this scale drawing of the festival area.

It is made up of a trapezium and a semicircle.

Scale 1 : 20 000

He needs to order fencing to go around the festival area.

He will leave gaps totalling 65 m for the gates.

Fencing comes in rolls 50 m in length.

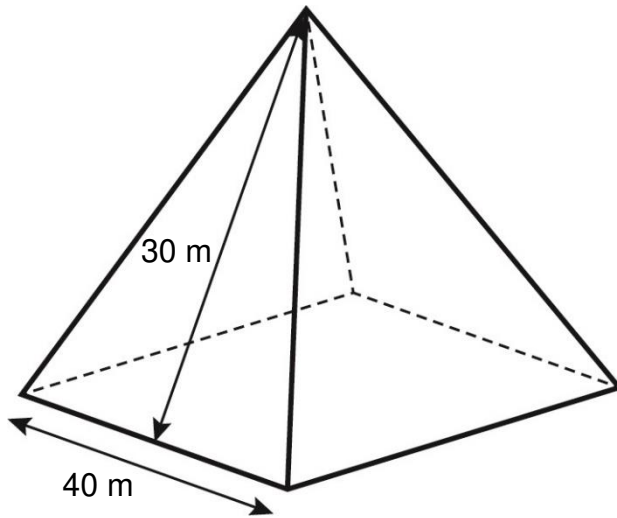How many rolls does Pavel need for the festival area?

Use $\pi = 3.14$

[5 marks]

Your answer: | **rolls**

Please turn over

3 (c)   The main stage is a square-based pyramid.

Pavel needs to work out the surface area of the four triangular faces of the pyramid.

Not drawn accurately

30 m

40 m

He uses this formula: $A = 4\left(\dfrac{bh}{2}\right)$

Where:

     A = surface area of the 4 triangular faces of the pyramid (m^2)
     b = length of the base of the triangular face (m)
     h = slant height of the triangular face (m)

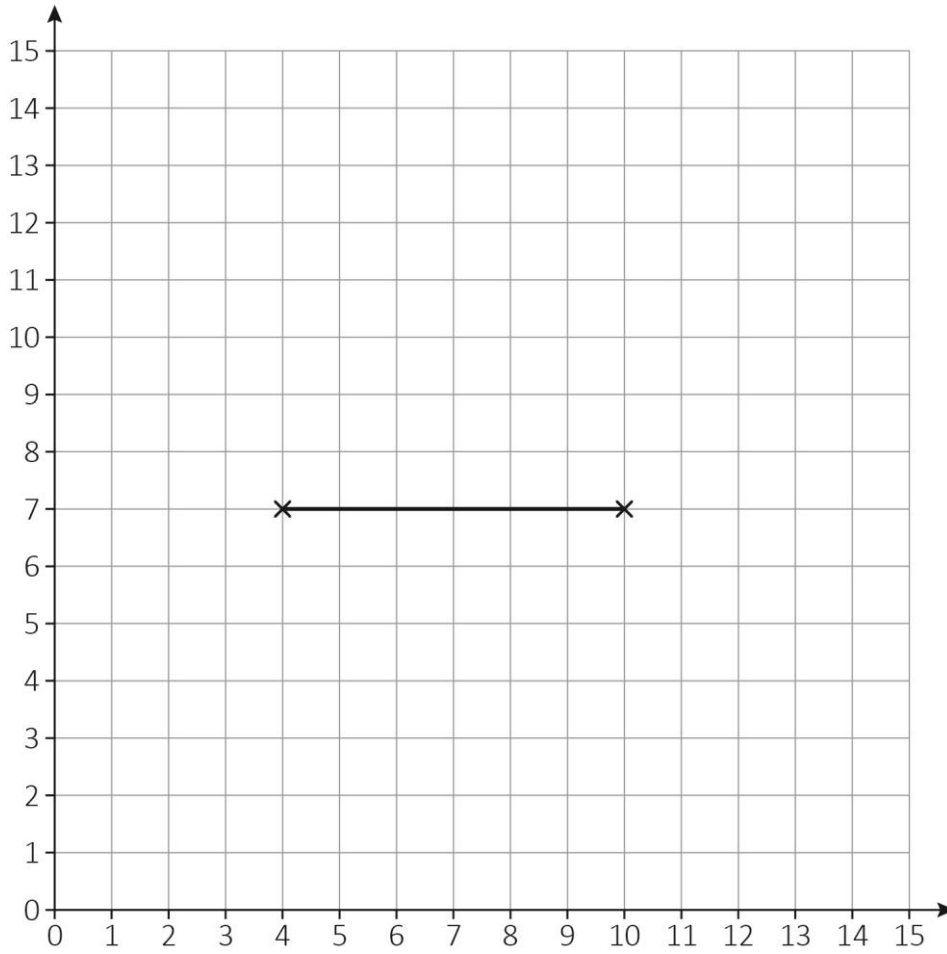Pavel thinks the total surface area of the 4 triangular faces of this pyramid is 1200 m^2

Is Pavel correct?

Show how you decide.

[2 marks]

Your answer:

3 (d)   The coordinate grid shows the space for the car park:

The car park is rectangular. It measures 120 m by 100 m

Each square on the grid represents 20 m by 20 m

Pavel draws two vertices and one edge of the car park area on the grid.

Write down possible coordinates for the other two vertices of the car park.

[2 marks]

Your answer:

Please turn over

13

3 (e)   The area where the festivalgoers will have their tents is 314 acres.

Pavel knows that for safety reasons each tent requires 27 m^2

He thinks that more than 50 000 tents can fit into this area.

Is he correct?

Show how you decide.

Use the conversion: 1 acre = 4046 m^2

[3 marks]

Your answer:

3 (f)

The probability that a festivalgoer chosen at random has travelled by car is $\frac{14}{25}$

What is the probability that they **did not** travel by car?

Give your answer as a decimal.

[2 marks]

Your answer:

[Total marks: 15]

Please turn over

Activity 4: College admissions

4 (a) Mel is an apprentice in a college admissions office.

She is organising interviews for new applicants.

The ratio of interviewers to applicants each day should be no higher than 2 : 15

There are 5 interviewers available on Monday.

What is the maximum number of applicants Mel should invite on Monday?

[2 marks]

Your answer:

4 (b) All applicants who attend the interview complete an initial assessment.

Mel has this scatter diagram about the results of the initial assessment:

Initial assessment marks and age of applicants

Initial assessment mark

Applicant's age

What fraction of applicants over the age of 26 scored more than 40 marks?

[3 marks]

Your answer:

Please turn over

17

4 (c)   Mel has information about applicants accepted on two new courses:

	Course A	**Course B**
Male applicant	22	71
Female applicant	59	48

What is the probability one of these applicants chosen at random is female and accepted on Course B?

Give your answer as a percentage.

[2 marks]

Your answer: %

4 (d)   Mel needs to write a report about the income from tuition fees.

She has this information about tuition fees:

Course	Fee
A	£390
B	£650
C	£720
D	£460
E	£390
F	£980
G	£720
H	£980
J	£720

Mel writes in her report,

'The college has a £1.7 million income target this year.'

If 1476 students enrol onto courses and pay the modal tuition fee, the college

will achieve more than $\frac{5}{8}$ of this target.

Is this statement correct?

Show how you decide.

[4 marks]

Your answer:

Please turn over

4 (e) The conversion rate is the proportion of all applicants who go on to enrol on a course.

This proportion is expressed as a decimal.

Mel needs to compare the conversion rates for this year and last year.

Mel has this information about enrolments this year:

- all applicants: 7680
- applicants who enrolled on a course: 4167

Last year, 6 out of every 11 applicants enrolled on a course.

Is the conversion rate this year lower than the conversion rate last year?

Show how you decide.

[2 marks]

Your answer:

4 (f) A new student takes out a student loan of £1450 for 2 years at a compound rate of 3% per annum.

Work out the amount of interest owed on this loan after 2 years.

[2 marks]

Your answer: £

[Total marks: 15]

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