



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

Paper number: P001441
Section A: Non-calculator Test



Time allowed: 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.

Learner information

- Section A contains **Activity 1** only.
- The maximum mark for this section is **15**.
- 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
- protractor.

To be completed by the examiner		Mark
A	Activity 1	/ 15
B	Activity 2	/ 15
	Activity 3	/ 15
	Activity 4	/ 15
TOTAL MARK		/ 60

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Centre name _____

Learner number Centre number

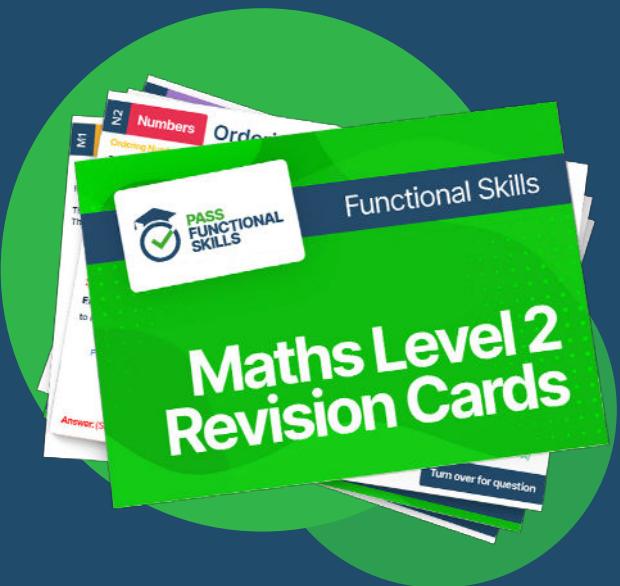
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Activity 1: Shopping centre

1 (a) Jessie is the manager of a shopping centre.

She knows that:

- $\frac{3}{5}$ of the shops sell clothes
- $\frac{1}{8}$ of the shops sell electronic goods
- all of the other shops sell food.

What fraction of the shops sell food?

[2 marks]

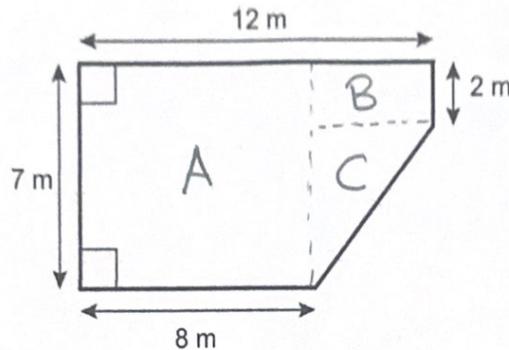
$$\frac{3}{5} = \frac{24}{40}, \frac{1}{8} = \frac{5}{40}$$
$$\text{Non food shops} = \frac{24}{40} + \frac{5}{40} = \frac{29}{40}$$
$$\text{food shops} = 1 - \frac{29}{40} = \frac{40-29}{40} = \frac{11}{40}$$

Your answer:

11/40

Please turn over

1 (b) Jessie will let this unit in the shopping centre:



Not drawn accurately

She has information about the floor areas of other available units in the shopping centre:

Unit floor area (m ²)	51.1	82.3	67.6	49.8	71.2	40.7	59.4	68.9	90.2
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Jessie thinks that the unit she will let has a floor area 12% larger than the median floor area of other available units.

Is she correct?

Show how you decide.

[5 marks]

$$\text{Area A: } 7 \times 8 = 56 \text{ m}^2$$

$$\text{Area B: } 2 \times (12-8) = 8 \text{ m}^2$$

$$\text{Area C: } \frac{1}{2} \times (12-8) \times (7-2) = \frac{1}{2} \times 4 \times 5 = 10 \text{ m}^2$$

$$\text{Total area} = 56 + 8 + 10 = 74 \text{ m}^2$$

Areas of other units in order:

40.7, 49.8, 51.1, 59.4, 67.6, 68.9, 71.2, 82.3, 90.2

67.6 m² is the median.

$$67.6 \times 1.12 = 75.712 > 74$$

So Jessie is wrong.

Your answer:

No.

1 (c) Jessie lets a unit with a floor area of 40 m^2 for 12 months.

The unit costs £27.59 per m^2 per month.

What is the total cost of letting this unit for 12 months?

[2 marks]

$27.59 \times 40 = \text{£}1103.60 \text{ per month.}$

10 months: £11,036

2 months: £ 2207.2

12 months: £13,243.20

Your answer:

£13243.20

Please turn over

1 (d) Jessie needs to work out how much bonus she will pay each of her workers for the last month.

She uses this formula to work out the bonus payment: $B = \frac{0.015T}{N}$

Where: B = bonus payment per worker (£)
 T = total sales (£)
 N = number of workers

Last month the total sales were £38 000

Jessie had 3 workers.

Work out the bonus payment each worker will get.

[3 marks]

$$\begin{aligned}0.015 \times 38,000 &= 0.01 \times 38000 \\&+ 0.005 \times 38000 \\&= 380 \\&+ 190 = £570.\end{aligned}$$

$$B = \frac{570}{3} = £190.$$

Your answer:

£ 190

1 (e) Jessie writes a report about the number of shoppers at the shopping centre.

She writes,

"Last week, we were only open for 6 days because of a bank holiday. The mean number of shoppers was 21 thousand a day and the range was 19.5 thousand shoppers."

Jessie has this information about this week:

Day of the week	Shoppers this week (in thousands)
Monday	15.4
Tuesday	12.5
Wednesday	17.3
Thursday	19.8
Friday	26.2
Saturday	39.6
Sunday	31.6

Compare this week and last week using the means and the ranges.

[3 marks]

$$\begin{aligned} \text{Total shoppers this week} &= 15.4 + 12.5 + 17.3 + 19.8 \\ &\quad + 26.2 + 39.6 + 31.6 \\ &= 162.4 \text{ (thousand)}, \end{aligned}$$

$$\text{The mean} = \frac{023.2}{7} = 23.2 \text{ (thousand)}$$

$$\text{Range} = 39.6 - 12.5 = 27.1 \text{ (thousand)}.$$

Your answer:

This week had a higher mean, but the daily number was less consistent.

[Total marks: 15]

This is the end of Section A.



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 $\pi = 3.14$

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.

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Please complete the details below clearly and in BLOCK CAPITALS.

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Centre name

Learner number

Centre number

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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]

Water used now: $350 \times 5.5 \times 20 = 38,500 \text{ L}$.

Water with new tap: $350 \times 4.7 \times 20 = 32,900 \text{ L}$.

Water saved: $38500 - 32900 = 5600 \text{ L}$

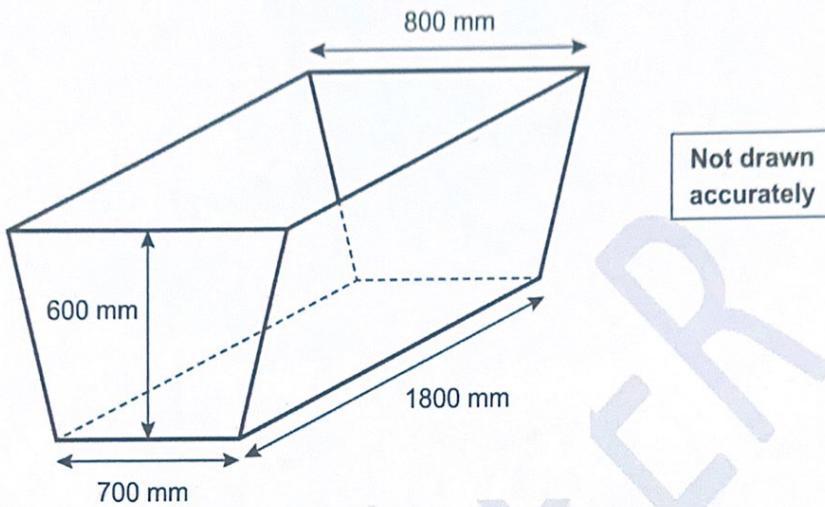
Your answer:

No, he'll save 5600L

Please turn over

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

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



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]

$$1\text{L} = 1000\text{cm}^3, 10\text{mm} = 1\text{cm}$$

$$\begin{aligned}\text{Normal fill: } & 0.78 \times 0.5 \times 60 \times (70+80) \times 180 \\ & = 631800\text{cm}^3 \\ & = 631.8\text{L.}\end{aligned}$$

$$\begin{aligned}\text{Reduced fill: } & 0.72 \times 0.5 \times 60 \times (70+80) \times 180 \\ & = 583200\text{cm}^3 \\ & = 583.2\text{L.}\end{aligned}$$

$$\begin{aligned}\text{Water Saved: } & 631.8\text{L} \\ & - 583.2\text{L} \\ & \hline 48.6\text{L}\end{aligned}$$

Your answer:

Yes, he'll save 48.6L.

Please turn over

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]

He uses $3 \times 6 = 18$ gallons

$18 \times 4.55 = 81.9$ L.

Water saved = $120 - 81.9 = 38.1$ L.

% saved = $\frac{38.1}{120} \times 100 = 31.75\%$

Your answer:

31.75 %

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

Total volume of water used this quarter: 118 m^3

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]

Volume used same quarter last year = x .

$$x \times (1 - 0.23) = 118$$
$$x \times 0.77 = 118.$$
$$x = 118 \div 0.77 = 153.2 \text{ (1 dp)}.$$

Your answer:

153.2 m^3

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
$0 \leq w < 200$	87
$200 \leq w < 400$	105
$400 \leq w < 600$	153
$600 \leq w < 800$	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]

Midpoint, w	Frequency, f	$Mid \times f$
100	87	8700
300	105	31500
500	153	76500
700	20	14000
	365	130700.

Estimated Mean = $\frac{130700}{365} = 358.08\dots$
 $= 358$
 (nearest whole number).

Your answer: 358 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]

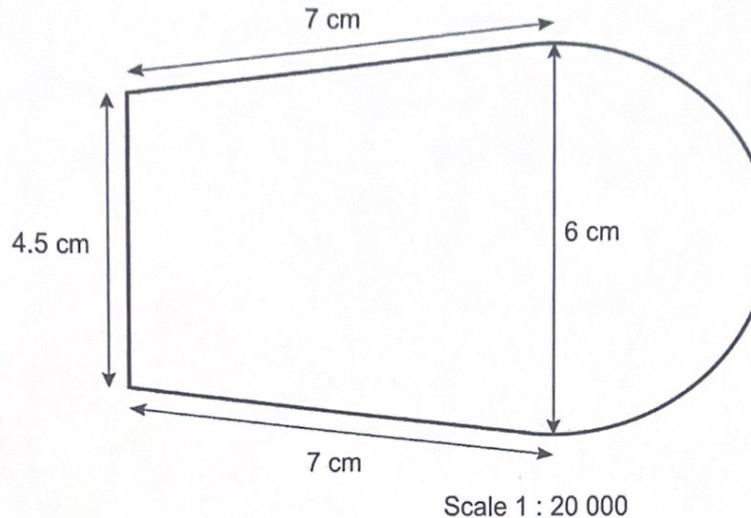
Your answer:

4908630

Please turn over

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

It is made up of a trapezium and a semicircle.



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]

Lengths of straight sides:

$$4.5 \times 20000 \div 100 = 900\text{m}$$

$$7 \times 20000 \div 100 = 1400\text{m}$$

$$7 \times 20000 \div 100 = 1400\text{m.}$$

Length of semi-circle; radius is 3cm.

$$6 \times 20000 \times 3.14 \times \frac{1}{2} \div 100 = 1884\text{m.}$$

$$\text{Total perimeter} = 900 + 1400 + 1400 + 1884 \\ = 5584\text{m.}$$

$$\text{Without gates: } 5584 - 65 = 5519\text{m.}$$

Number of Rolls of fence needed:

$$5519 \div 50 = 110.38.$$

111 rolls needed.

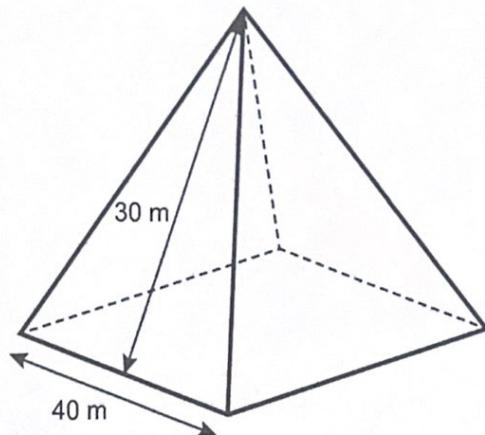
Your answer:

111 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

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

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]

$$b = 40, h = 30.$$

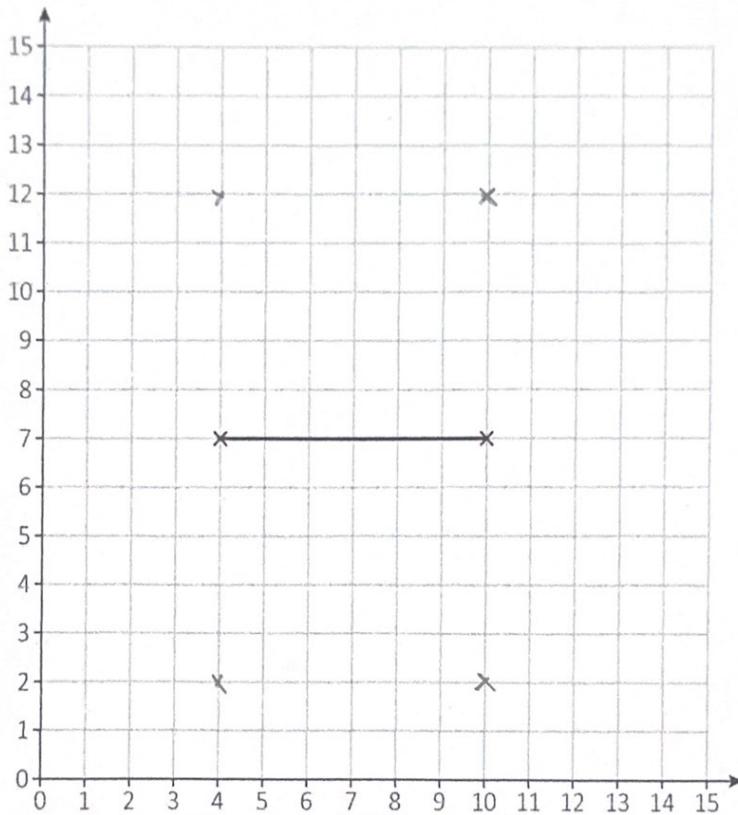
$$\text{So } A = 4 \times \left(\frac{40 \times 30}{2} \right) = 2400 \text{ m}^2.$$

Pavel is incorrect.

Your answer:

No, it's 2400 m^2 .

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]

(4, 2) and (10, 2) or (4, 12) and (10, 12).

Your answer:

(4, 2) & (10, 2) or (4, 12) (10, 12)

Please turn over

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]

$$\text{Tent area: } 314 \times 4046 = 1270444 \text{ m}^2$$

$$1270444 \div 50000 = 25.40888 \text{ m}^2 \text{ per tent.}$$

So less than 50,000 tents can fit.

$$50000 \times 27 = 1350000 \text{ m}^2.$$

Your answer:

No.

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]

$$1 - \frac{14}{25} = \frac{25-14}{25} = \frac{11}{25} = \cancel{0.44} \\ = 0.44$$

Your answer:

0.44

[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]

$$\times 2.5 \quad (2:15) \times 2.5 \\ 5:37.5$$

We have to round down or else we'd exceed the ratio.

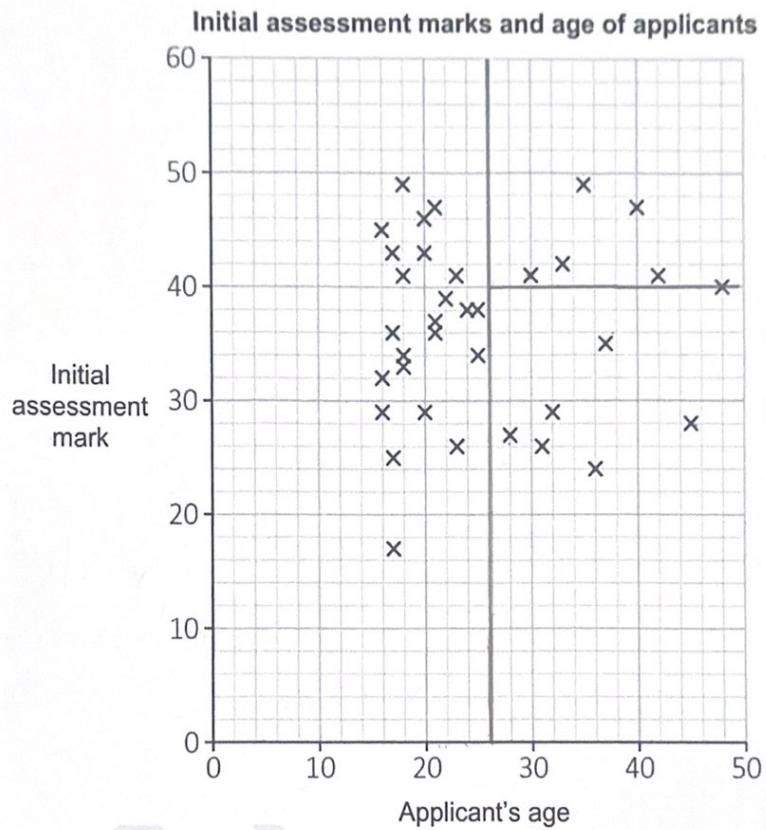
37 applicants.

Your answer:

37.

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

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



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

[3 marks]

Applicants over 26 = 12.
Those who scored > 40 = 5.
Therefore $\frac{5}{12}$.

Your answer:

$\frac{5}{12}$.

Please turn over

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]

Total accepted: $22 + 71 + 59 + 48 = 200$.

Female applicants on course B = 48.

$$\frac{48}{200} \times 100 = 24\%$$

Your answer:

24%

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]

Modal fee = £720.

$720 \times 1476 = £1,062,720$

$\frac{5}{8} \times 1,700,000 = \cancel{1,750,000}$
 $= £1,062,500$

So yes, 1476 students on the modal fee is more than $\frac{5}{8}$ of the target.

Your answer:

Yes.

Please turn over



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ATTEMPT DATE	DIFFICULTY	RESULT
25/04/2022 15:39	Easy	80%
18/01/2022 14:01	Medium	20%

Using Numbers

16 TOPICS

27.08% Complete



Start Learning

- ✓ Your answers are analysed to determine your Current Level
- ✓ Suggested courses for you to enrol on based on your calculated level
- ✓ Always know the level you are currently working at
- ✓ Determine when you are ready to sit your exam

The screenshot shows a Mathletics interface. On the left, a 'Lesson' section titled 'Why do we write?' displays a slide with a blue background, a sun, a crescent moon, and a question: 'Why do we write?'. Below the slide is a video player showing a video titled 'How to calculate the area of a rectangle' by 'Mathsaurus'. On the right, a 'Practice' section titled 'Question 2 of 6' shows a question: 'Some students were asked about the number of hours they spend per week studying. Their answers are listed below.' with options 8, 9, 12, 15, 16, 18, 20, 23, 25. Below this is a math problem: 'The diagram shows a rectangle of width 6 cm and height 3 cm. The top-right corner is cut off to form a smaller triangle. Not drawn accurately. Calculate the total area of the remaining part in cm^2 . 1 second place'. The diagram shows a rectangle with a right-angled triangle cut out from the top-right corner. The base of the triangle is 2 cm and its height is 1 cm. The area of the triangle is $0.5 \times 2 \times 1 = 1 cm^2$. The area of the remaining part is $6 \times 3 - 1 = 17 cm^2$. A 'Feedback' box on the right says 'Your answer' is 17 and 'Correct answer' is 17. It also shows 'Previous' and 'Next' buttons. At the bottom, a 'Topic Test Instructions' box for 'Addition and Subtraction (including decimals)' is visible, along with a 'Mathletics' logo and a 'Mathletics' button.

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