AQA

Centre number ☐☐☐☐☐   Candidate number ☐☐☐☐

Surname _____

Forename(s) _____

Candidate signature _____

Functional Skills Certificate
FUNCTIONAL MATHEMATICS
Level 2

Wednesday 17 May 2017   Morning   Time allowed: 1 hour 30 minutes

Materials
For this paper you must have:
- a calculator
- mathematical instruments
- a copy of the Data Book (Examination) (enclosed).

Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Answer all questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.
- State the units of your answer where appropriate.

Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 60.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.
- Evidence of checking is specifically assessed in Questions 1(c) and 4(d). These questions are indicated with a †.

Advice
- In all calculations, show clearly how you work out your answer.

For Examiner's Use	
Question	Mark
1	
2	
3	
4	
TOTAL	

4368

QAN 500/8702/2

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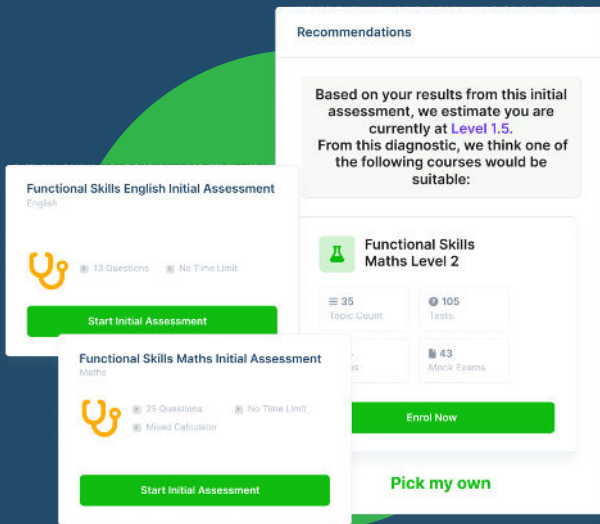
FUNCTIONAL SKILLS ONLINE COURSES

✅ 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

✅ Explainer videos on every topic

✅ Quick-fire style mutiple choice questions

✅ Test your knowledge with exam-style questions

✅ Written solutions for all questions
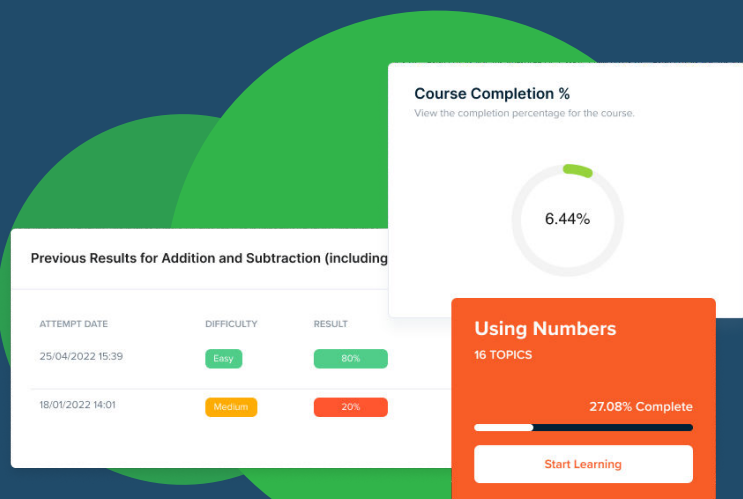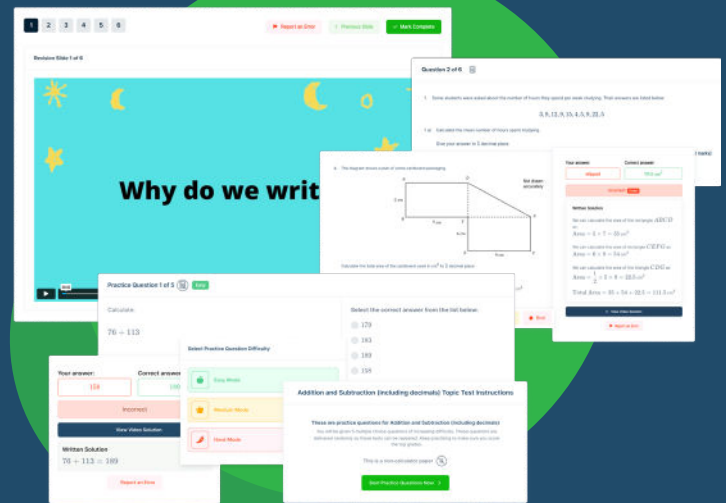
✅ See your progress through as you progress through each topic area

✅ Get your average scores for practice questions, topic tests and mock exams

✅ View all practice question, topic test and mock exam attempts over time

✅ View historical attempts to analyse your progress over time

Or visit
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ANSWER IN THE SPACES PROVIDED

Answer **all** questions in the spaces provided.

1   **Hot Air Balloon**
     There is a **data sheet** for Hot Air Balloon.

     Jo

     Jo is a private balloon pilot.
     She wants to qualify to carry passengers.

1 (a)   Jo has already completed seven flights.
        These flights lasted a total of 26 hours.

        She completes three more flights.

	Day	Start time	Finish time
Flight 1	Monday	8.00 am	11.30 am
Flight 2	Friday	10.45 am	1.00 pm
Flight 3	Saturday	2.40 pm	6.00 pm

Jo says,
     "I have now completed the hours I need to qualify."

Is Jo correct?
You **must** show your working.

[4 marks]

$8am \rightarrow 11.30am \rightarrow 3\frac{1}{2}$ hrs, $10.45am \rightarrow 1pm = 2\frac{1}{4}$ hrs, $2.40pm \rightarrow 6pm$
$= 3\frac{1}{3}$ hrs.

$3\frac{1}{2} + 2\frac{1}{4} + 3\frac{1}{3} = \frac{109}{12}$ hrs.

$\frac{109}{12} + 26 = 35\frac{1}{12}$ hrs. Jo is correct.

Turn over ▶

1 (b)   On one of the flights, the balloon reaches a height of 1546.5 **metres**.

Circle the height that the balloon reaches in **feet**.

[1 mark]

463.95   515.5   5103.45   (5155)

†1 (c)   Jo rents a balloon with an envelope volume of 3198 m^3
A balloon can lift 1 kilogram for every 3.9 m^3 of envelope volume.

Work out the maximum number of kilograms this balloon can lift.

[2 marks]

$$\frac{3198}{3.9} = 820 kg.$$

Check your answer by rounding

3198 to the nearest 100

and

3.9 to the nearest whole number.

[1 mark]

$$\frac{3200}{4} = 800$$

1 (d)   Jo rents the balloon for a year.
She makes these notes about the flights and costs for the year.

There will be

  7 flights each month in April, May, September and October

  9 flights each month in June, July and August.

The balloon can hold the pilot and 4 passengers.
I will charge each passenger £135 for a ticket.

My costs will be

  £5700 for rent and insurance for the year

  £42 for fuel for **each** flight.

Jo says,

  "If I sell 80% of the tickets I will make a profit of **more than** £16 000"

Is she correct?

You **must** show your working.

[7 marks]

$(4 \times 7) + (3 \times 9) = 55$ flights.

$55 \times 4 \times 0.8 \times 135 = £23760$ made
                                              over all months

£42 × 55 = £2310 in fuel.

```
  2 3 7 6 0                    ̶2̶1̶4̶5̶0̶    ¹2̶ ¹0̶4 5 0
-   2 3 1 0      ⇒                        - 5 7 0 0
  ‾‾‾‾‾‾‾‾‾                               ‾‾‾‾‾‾‾‾‾
  2 1 4 5 0                                1 5 7 5 0
```

She is not correct.

2 **Muesli**

Rory

Rory finds the number of calories in different brands of muesli.

Muesli	Calories per serving
Brand W	222
Brand X	170
Brand Y	219
Brand Z	188

He also finds this information.

	Calories
One serving of yoghurt	50
Glass of apple juice	86
Glass of cranberry juice	48
Cup of coffee	25
Cup of tea	10

For a healthy diet, Rory is allowed 2700 calories a day.

He wants his breakfast to have between 15% and 20% of 2700 calories.

2 (a) Show that Rory's breakfast should have between 405 and 540 calories.

[2 marks]

$0.15 \times 2700 = 405$ kcal

$0.20 \times 2700 = 540$ kcal

2 (b) For breakfast, Rory has

- two servings of muesli
- two servings of yoghurt
- a glass of apple juice or cranberry juice
- a cup of tea or coffee.

Plan a breakfast that Rory can have.

Include the total calories.

[3 marks]

Yoghurt : $2 \times 50 = 100$.

Brand X : $2 \times 170 = 340$.

Tea + AJ : $10 + 86 = 96$.

```
   100
   340
 +  96
  536 .
```

Yoghurt, Brand X of muesli, tea and apple juice.

Turn over ▶

2 (c) Lara makes her own muesli.

To make 500 g of muesli she needs

325 g oats	20 g dried apricots
35 g nuts	40 g dried cranberries
40 g raisins	40 g sunflower seeds

Lara makes these notes.

> 1 kg of oats costs 80p
>
> 100 g of nuts cost £1.40
>
> For 500 g of muesli, the other ingredients cost a total of 96p
>
> A box of similar muesli from a shop costs £2.94 for 500 g

She says,

"For 500 g, my muesli is cheaper than the shop muesli by **more than** £1.20"

Is she correct?

You **must** show your working.

[6 marks]

$$0.325 \times 80p = 26p.$$

$$0.35 \times £1.40 = 49p.$$

$$
\begin{array}{r}
0.26 \\
0.49 \\
+\ 0.96 \\
\hline
1.71 \\
\hline
\end{array}
$$

£2.94 − £1.71

= £1.23.

She is correct.

2 (d)   Sam also makes his own muesli from oats, fruit and seeds.

By weight, he wants

- $\frac{3}{5}$ of the muesli to be oats
- fruit to be four times as much as seeds.

He has 900 g of oats.

He uses all of the oats to make some muesli.

How many grams of fruit does he need?

[4 marks]

$\frac{2}{5} \times 900g = 360g \Rightarrow$ $360 \div \frac{3}{5} = 600g$ will

not be oats.

$\frac{4}{5}$ of remaining mix (i.e. 600g) should

be fruit.

$\frac{4}{5} \times 600g = 480g.$

15

Turn over for the next question

3 **Canteen Survey**

Betty is the manager of the college canteen.

I want to improve the service we offer.

To help me I will carry out a survey.

Betty

100 students completed Betty's survey form.

Here is one of the completed forms.

Canteen Survey

A Circle the number of days that you used the canteen last week.

0   1   ②   3   4   5

B Tick a box to show which of these sandwiches you like best.

Cheese and Pickle	
Egg and Cress	✓
Bacon, Lettuce and Tomato	
Chicken Salad	
Tuna and Sweetcorn	

C The canteen is thinking of selling sushi.

Tick a box to show what type of sushi you would like best.

Salmon	
Prawn	
Tuna	✓
Vegetable	
None	

---

3 (a) The mean number of days the 100 students used the canteen that week was 1.7

Betty put some more seats in the canteen.

She then asked the same 100 students question **A** again.

Here is some information about their answers.

Number of days	Number of students
0	16
1	14
2	11
3	44
4	13
5	2
	Total = 100

Betty says,

"The mean number of days the students used the canteen has increased."

Is she correct?

You **must** show your working.

[4 marks]

$(1 \times 14) + (2 \times 11) + (3 \times 44) + (4 \times 13) + (5 \times 2)$

$= 230.$

$\frac{230}{100} = 2.3$

She is correct.

The table shows information about the answers to question **B**.
It also shows the price of each type of sandwich.

Sandwich	Number of students	Price
Cheese and Pickle	8	£1.40
Egg and Cress	10	£1.60
Bacon, Lettuce and Tomato	32	£3.00
Chicken Salad	38	£2.00
Tuna and Sweetcorn	12	£3.00
	Total = 100	

Betty usually makes 15 of each type of sandwich each day.

3 (b)   Betty decides to double the **total** number of sandwiches she makes.

Show that she will now make 150 sandwiches each day.

[1 mark]

15 × 5 × 2 = 150.

3 (c) Betty uses the information in the table about the answers to question **B**.
She works out how many of each type of sandwich to make.
She then works out how much money she could take from selling the 150 sandwiches.

She says,

"If I sell all the sandwiches I will take **more than** £350 each day."

Is she correct?

You **must** show your working.

[6 marks]

$$\frac{150}{100} = 1.5$$

$\Rightarrow$ C+P: $1.5 \times 8 = 12$, E+C: $1.5 \times 10 = 15$, BLT: $32 \times 1.5 = 48$,

CS: $38 \times 1.5 = 57$, T+S: $12 \times 1.5 = 18$.

C+P: $12 \times 1.4 = £16.80$, E+C: $15 \times 1.6 = £24$,

BLT: $48 \times 3 = £144$, CS: $57 \times 2 = £114$, T+S: $18 \times 3 = £54$.

```
    16.8
    24.0
 1 44.0
 1 14.0
 1 54.0
 1 2
 3 52.80
```

£352.80.

Yes, she is correct.

3 (d)   Here is some information about the answers to question **C**.

Type of sushi	Tally	
Salmon	卌 卌 卌 ‖	17
Prawn	卌 卌 卌 卌 卌	25
Tuna	卌 卌 卌 ‖	17
Vegetable	卌 卌	10
None	卌 卌 卌 卌 卌 卌	31

Betty wants to show this information in a diagram.

Draw an appropriate diagram that Betty could use.
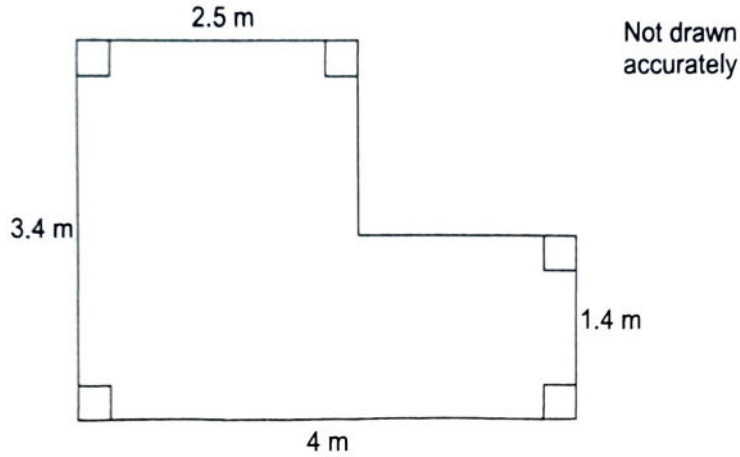
Use the space below **or** the grid opposite.

[4 marks]

Type of Sushi

Turn over for the next question

16
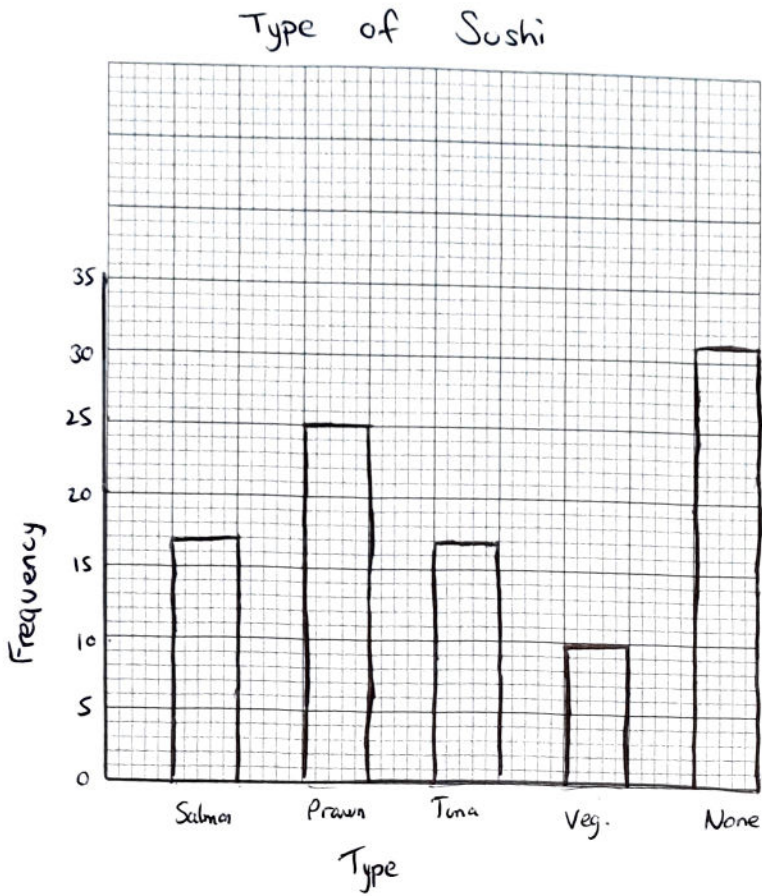
4 **Room Makeover**

There is a **data sheet** for Room Makeover.

Here is a sketch of Tom's bedroom floor.

2.5 m

Not drawn
accurately

3.4 m

1.4 m

4 m

4 (a) Show that the floor area of this bedroom is 10.6 m^2

[2 marks]

$(3.4 \times 2.5) + ((4-2.5) \times 1.4) = 10.6 m^2$.

4 (b) The bedroom has height 2.4 m
Tom wants a new **double** radiator.

Work out the smallest length of radiator he should buy.
You **must** show your working.

[3 marks]

Vol: $10.6 m^2 \times 2.4m = 25.44 m^3$

$25.44 \times 141 = 3587.04$

$\Rightarrow$ 600 mm radiator needed

4 (c)   Tom wants to replace the carpet in his bedroom with laminate flooring.

He finds this information.

> **Foam underlay for laminate flooring**
>
> Sold in rolls
>
> £17.95 a roll (covers 15 m^2)
>
> **Oak laminate flooring**
>
> Sold in packs
>
> £23.80 per pack (covers 1.72 m^2)
>
> **Edging**
>
> Sold in strips
>
> £1.65 per 2-metre strip

Tom says,

     "It will cost under £200 to buy enough underlay, laminate flooring and edging."

Is Tom correct?

You **must** show your working.

[7 marks]

$$\frac{10.6}{15} = 0.70\dot{6} \Rightarrow 1 \text{ roll of foam.}$$

$$\Rightarrow £17.95.$$

$$\frac{10.6}{1.72} = 6.163 \Rightarrow 7 \text{ ~~rolls~~ packs of oak}$$

$$\Rightarrow 7 \times £23.80 = £166.60.$$

Perimeter = 3.4 + 2.5 + 2 + 1.5 + 1.4 + 4 = 14.8 m

$$\frac{14.8}{2} = 7.4 \Rightarrow 8 \text{ strips needed.}$$

$$\Rightarrow 8 \times £1.65 = £13.20$$

£17.95 + £166.60 + £13.20 = £197.75

He is correct.
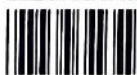
t4 (d) Tom hires Ali to lay the floor.

Ali charges £18 per hour.

He works for $7\frac{3}{4}$ hours.

How much does he charge Tom for $7\frac{3}{4}$ hours work?

[2 marks]

7.75hrx £18/hr = £139.50

Check your answer.

Show how you have done your check.

[1 mark]

$\frac{£139.50}{7.75hr}$ = £18 /hr.

15

END OF QUESTIONS

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ANSWER IN THE SPACES PROVIDED

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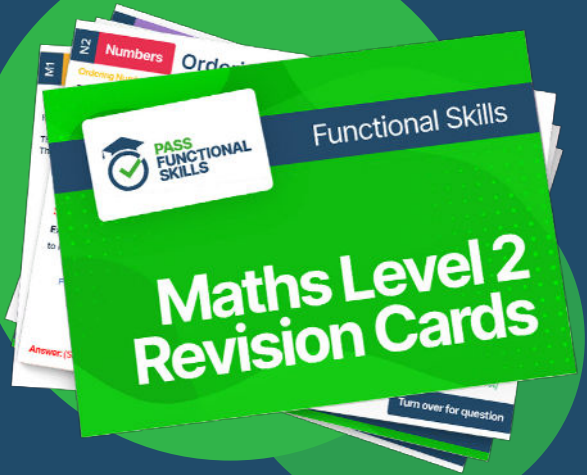
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