AQA

Please write clearly in block capitals.

Centre number | | | | | | Candidate number | | | | |

Surname _____

Forename(s) _____

Candidate signature _____

I declare this is my own work.

Functional Skills Level 2 MATHEMATICS

Paper 2 Calculator

Thursday 3 November 2022 Afternoon Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:
- a calculator
- mathematical instruments.

For Examiner's Use	
Question	Mark
1–8	
9	
10	
11	
12	
TOTAL	

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.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- 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.
- If your calculator does not have a π button, take the value of π to be 3.142

Advice

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

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IB/H/Nov22/E11

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QAN 603/4258/4

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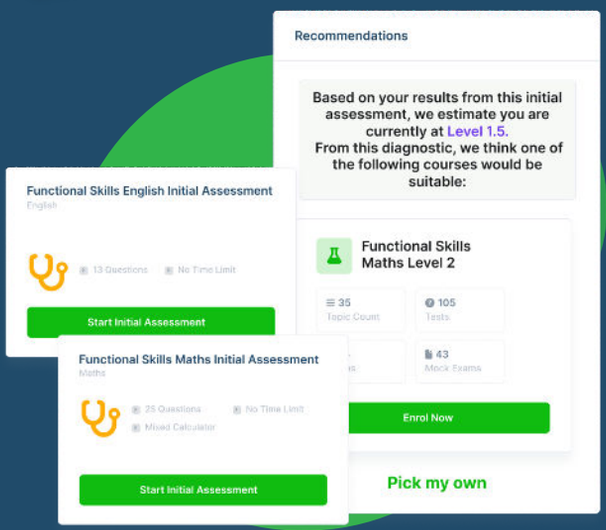
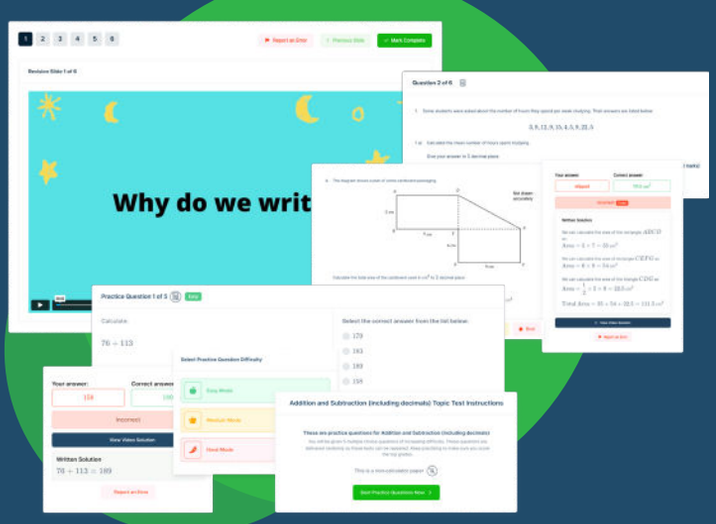
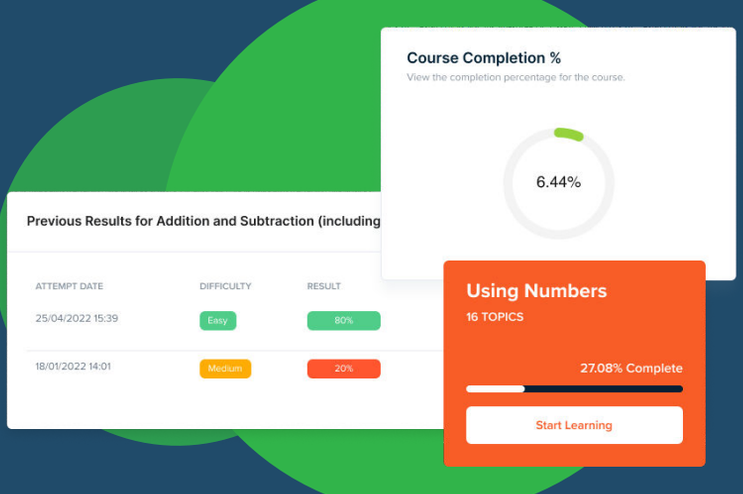
FUNCTIONAL SKILLS ONLINE COURSES



- 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
passfunctionalskills.co.uk

Do not write outside the box

Section A

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

1 Circle the integer. ⌒ whole number

[1 mark]

0.5 $\frac{1}{8}$ (7) −10.2

2 Write 9 507 211 in words.

[1 mark]

Answer Nine million, five hundred and seven thousand two hundred and eleven

3 Work out 3 years to 9 months as a ratio.

Give your answer in its simplest form.

[2 marks]

3 years = 3 x 12 months = 36 months ÷9 (36 : 9 ↘ 4 : 1 ↙) ÷9

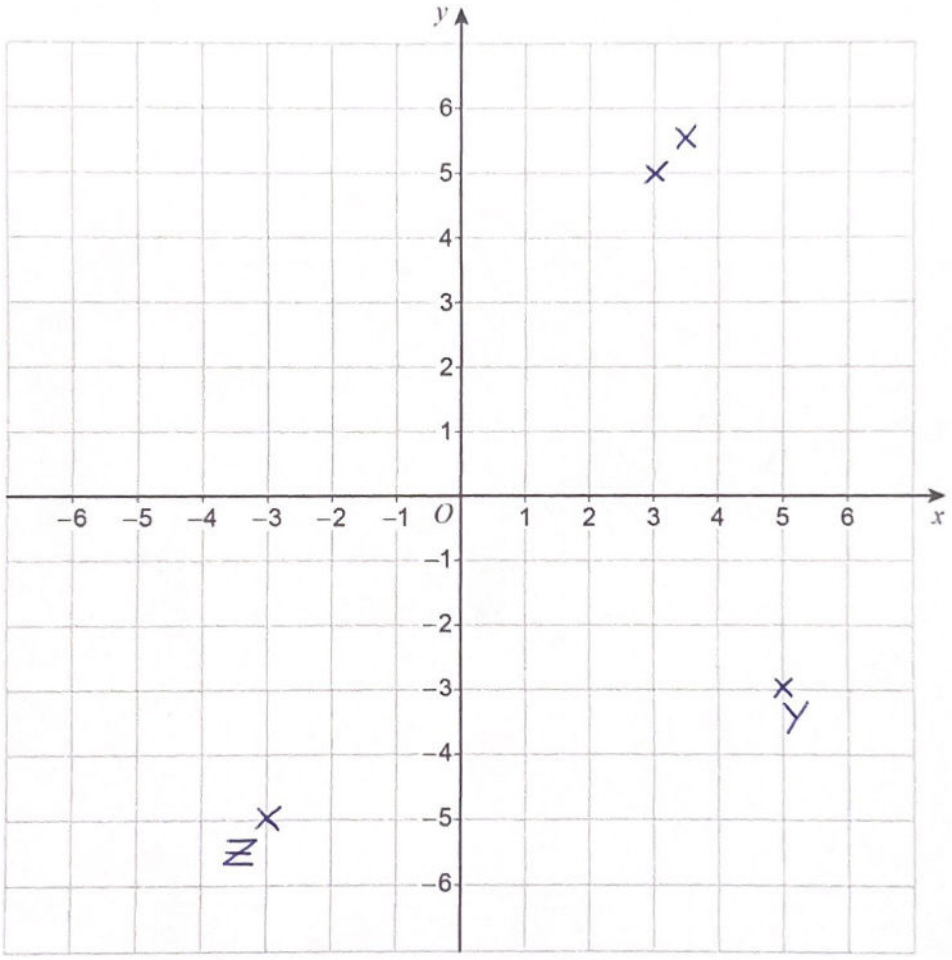
Answer 4 : 1

Do not write outside the box

4 On the grid, plot and label the points X, Y and Z.

[2 marks]

$X = (3, 5)$ $Y = (5, -3)$ $Z = (-3, -5)$

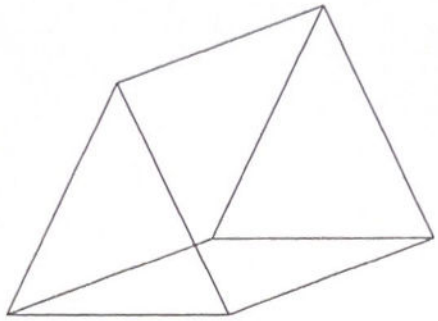


Turn over for the next question

Do not write outside the box

5 Write the mathematical name of this solid shape.

[1 mark]



Answer Triangular Prism

6 Calculate $2\frac{1}{5} + 1\frac{3}{4}$

[1 mark]

$2\frac{1}{5} + 1\frac{3}{4} = \frac{11}{5} + \frac{7}{4} = \frac{44}{20} + \frac{35}{20}$

$= \frac{79}{20} = 3.95$

$= 3\frac{19}{20}$

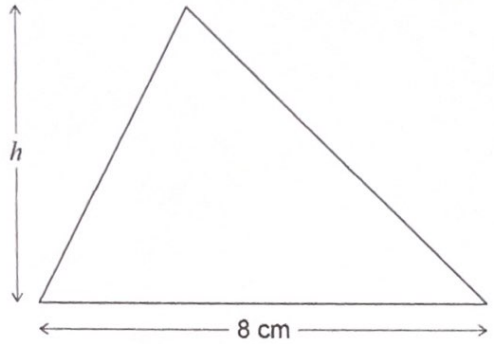
Answer

Do not write outside the box

7 A triangle has an area of 20 cm^2

The base of the triangle is 8 cm

Not drawn accurately



Work out the perpendicular height, h, of the triangle.

[2 marks]

Area of triangle $= \frac{1}{2}bh$

$\frac{1}{2} \times 8 \times h = 20$

$8 \times h = 40 \Rightarrow h = 5$

Answer 5 cm

8 Calculate $2(7 + 3k)$ when $k = -1.8$

[2 marks]

$2(7 + 3 \times -1.8) = 2(7 + (-5.4))$

$= 2 \times 1.6 = 3.2$

Answer 3.2

12

Do not write outside the box

Section B

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

9 Lorry driving

Asha is a lorry driver.

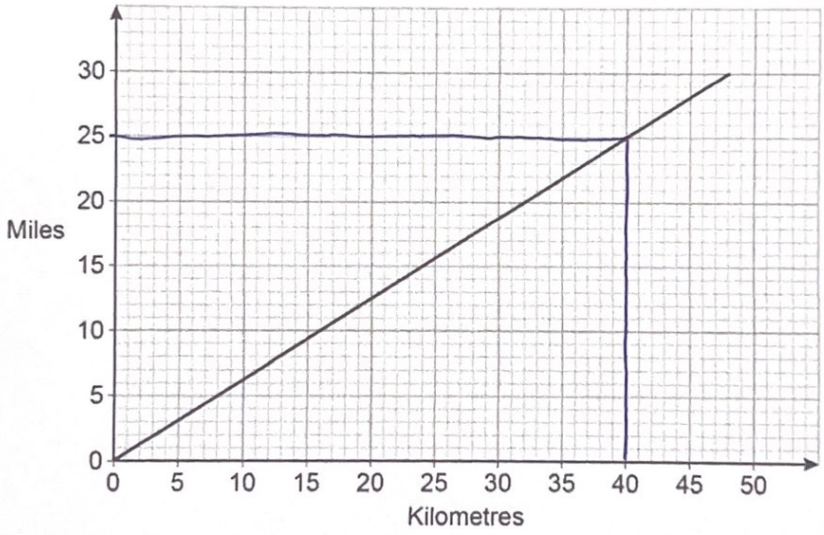
9 (a) Asha drives from Southampton to Leeds.

The journey

is 380 kilometres

takes 5 hours and 30 minutes.

The graph can be used to convert between miles and kilometres.



Asha works out that his average speed is **over** 40 mph

Is he correct?

You **must** show your working.

[4 marks]

40 km = 25 miles 1.6 km = 1 mile

380 ÷ 1.6 = 237.5 miles

d / S | T

average speed = 237.5 ÷ 5.5

= 43.2 mph > 40 mph

yes he is correct.

Do not write outside the box

9 (b) The amount Asha is paid each week is calculated using the formula

$$P = 0.73(0.14d + 65n)$$

where

P = pay in pounds

d = distance driven in kilometres that week

n = number of days worked that week

Last week Asha worked for 5 days.

His pay for last week's work was £605.17

How many kilometres did Asha drive last week?

[4 marks]

$n = 5$

$P = 605.17$

$d = ?$

$605.17 = 0.73(0.14d + 65 \times 5)$

$605.17 = 0.1022d + 237.25$

$0.1022d = 605.17 - 237.25$

$0.1022d = 367.92$

$d = 3600$ km

Answer 3600 kilometres

8

Turn over for the next question

Do not write outside the box

10 **Fundraising**

Carol is fundraising for a sports club.

10 (a) Carol designs a game.

The game uses

a bag containing a red ball, a blue ball and a yellow ball

a fair, 5-sided spinner.

The player

picks a ball at random from the bag

and

spins the spinner.

The player wins if they pick the **red** ball and the spinner lands on an **even** number.

Carol says,

"The chance of winning is **more than** 10%"

Is she correct?

You **must** show your working.

[4 marks]

$\frac{1}{3}$ chance of picking red ball

$\frac{2}{5}$ change spinner will be even

$\frac{1}{3} \times \frac{2}{5} = \frac{2}{15} = 0.1333...$ or $13.3\% > 10\%$.

So she is correct.

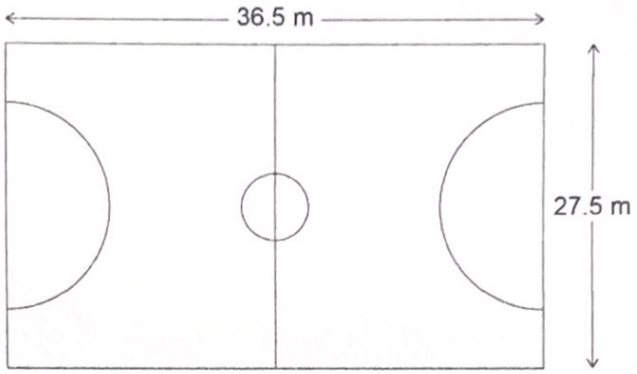
Do not write outside the box

10 (b) The club wants to use some of the money to paint the lines on a mini football pitch.

The lines to be painted are

- the four sides of a rectangle measuring 27.5 m by 36.5 m
- a halfway line measuring 27.5 m
- a centre circle with a radius of 1.5 m
- two semicircles, each with a radius of 8 m

Not drawn accurately



It costs £3.25 per metre to paint the lines.

In total, how much will it cost to paint all the lines?

[6 marks]

centre circle : circumference = $\pi \times 3 = 3\pi$

semi circles : circumference = $\frac{1}{2} \times \pi \times 16 = 8\pi$

2 of them $8\pi \times 2 = 16\pi$

straight lines = $36.5 + 36.5 + 27.5 + 27.5 + 27.5$

$= 155.5$

Total length to paint = $155.5 + 16\pi + 3\pi$

$= 215.1902\ldots$ m

$215.1902\ldots \times 3.25 = 699.37$

Answer £ 699.37

Turn over ▶

Do not write outside the box

10 (c) After painting the lines the club has £8225

They invest $\frac{2}{7}$ of this money in a bank account for 4 years.

The account pays compound interest at 3% per year.

Is the investment worth **more than** £2700 at the end of the **4** years?

You **must** show your working.

[4 marks]

$8225 \times \frac{2}{7} = 2350$

3% multiplier of 1.03

$2350 \times 1.03^4 = 2644.95 < 2700$

no it isn't worth more than £2700

14

Do not write outside the box

11 **Ice cream**

Suzi has an ice cream van.

11 (a) Suzi buys tubs of ice cream and sells scoops of ice cream.

Each scoop is in the shape of a sphere with radius 2.8 cm

volume of sphere $= \frac{4}{3}\pi r^3$

r = radius of sphere

Suzi buys 5-litre tubs.

1 litre = 1000 cm^3

Suzi wants to buy enough tubs to sell at least 200 scoops.

Work out how many tubs Suzi should buy.

You **must** show your working.

[5 marks]

$\frac{4}{3} \times \pi \times 2.8^3 = 91.9523...$

$91.9523 \times 200 = 18390.46451...$

$18390.46 \div 1000 = 18.39\ L$

$18.39 \div 5 = 3.67809$

so will need 4 tubs to fit 200 scoops.

Answer 4 tubs

Question 11 continues on the next page

Do not write outside the box

11 (b) Suzi uses a 15% discount voucher when she buys the tubs of ice cream.

She pays £76.50 after the discount.

Suzi says,

"I save **less than** £14 by using the discount voucher."

Show working to support this statement.

[3 marks]

$1 - 0.15 = 0.85$

$76.5 \div 0.85 = 90$

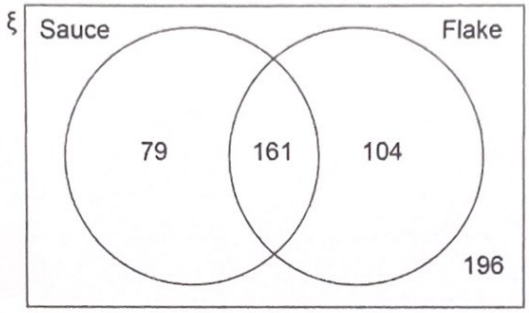
$90 - 76.5 = 13.5 < 14$

Do not write outside the box

11 (c) Suzi sells two ice cream toppings, sauce and flake.

She hopes that the probability that a customer, picked at random, buys **at least one** topping will be more than $\frac{7}{10}$

The Venn diagram shows what toppings the customers buy over one weekend.



Over this weekend, does Suzi achieve the probability she hopes to get?

You **must** show your working.

[3 marks]

79 + 161 + 104 + 196 = 540 total customers

79 + 161 + 104 = 344 customers buy at least one topping

$\frac{344}{540} = 0.637 < 0.7$

so no she didn't achieve her desired probability.

11

Turn over for the next question

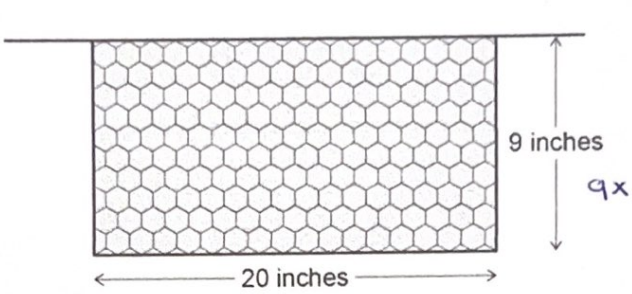
Do not write outside the box

12 **Bees**

Mary keeps bees and sells the honey they produce.

12 (a) The bees live in a beehive.

Mary's beehive holds rectangular frames full of honeycomb.



Each frame measures 9 inches by 20 inches.

The beehive holds 8 frames.

Mary cuts the honeycomb into rectangular pieces measuring 11 cm by 7.5 cm

Work out the maximum number of pieces that Mary can get from her **beehive**.

Use 1 inch = 2.5 cm

[5 marks]

50 ÷ 11 = 4.5 4 pieces ↔

22.5 ÷ 7.5 = 3 pieces ↕

4 x 3 = 12 pieces per frame

12 x 8 = 96 pieces in 8 frames

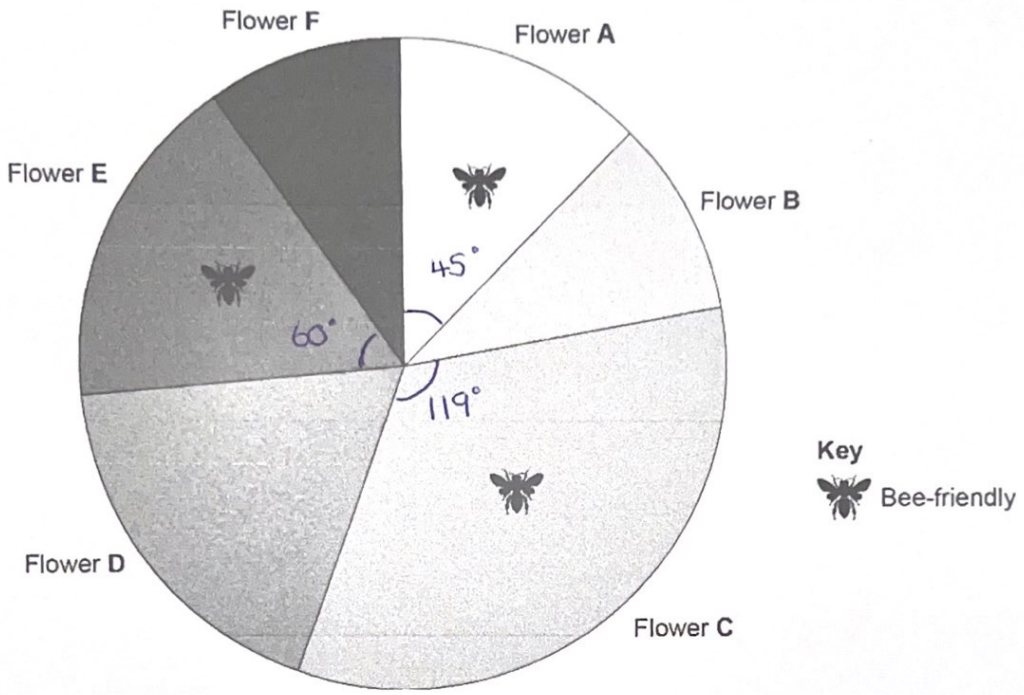
Answer 96. pieces.

Do not write outside the box

12 (b) Mary wants to grow some bee-friendly flowers.

She finds information about the different flowers produced from two packets of seeds.

Packet 1



Two thirds of the seeds in **Packet 2** produce bee-friendly flowers.

Mary wants to buy the packet producing the greater proportion of bee-friendly flowers.

Which packet should she buy?

You **must** show your working.

[4 marks]

measure with protractors

119 + 60 + 45 = 224° bee friendly

~~360~~

Packet 2 $\frac{1}{3} \times 360 = 120$

$120 \times 2 = 240 > 224$

Packet 2 is more bee-friendly.

Do not write outside the box

12 (c) Here are the instructions for planting flower seeds.

Use 4 grams of seed per square metre of garden.

Mix the seeds with sand in the ratio

mass of seed : mass of sand = 2 : 5

Mary measures her neighbours' gardens to work out the average-sized garden.

Garden (m^2)	Frequency	Midpoint	
$0 < \text{area} \leqslant 10$	2	5	10
$10 < \text{area} \leqslant 20$	8	15	120
$20 < \text{area} \leqslant 30$	12	25	300
$30 < \text{area} \leqslant 40$	3	35	105
	25		535

Estimate the total mass of seed and sand mix needed to cover an average-sized garden.

[6 marks]

see table -

2 x 5 = 10

8 x 15 = 120

12 x 25 = 300

3 x 35 = 105

535 ÷ 25 = 21.4 m^2 average sized garden

21.4 x 4 = 85.6 grams of seed for average garden.

using the ratio

85.6 ÷ 2 x 5 = 214 g of sand

Total mass of seed and sand mix = 214 + 85.6

= 299.6

Answer 299.6 grams

15

END OF QUESTIONS