

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

Paper number: P001260
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
- protractor
- 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.

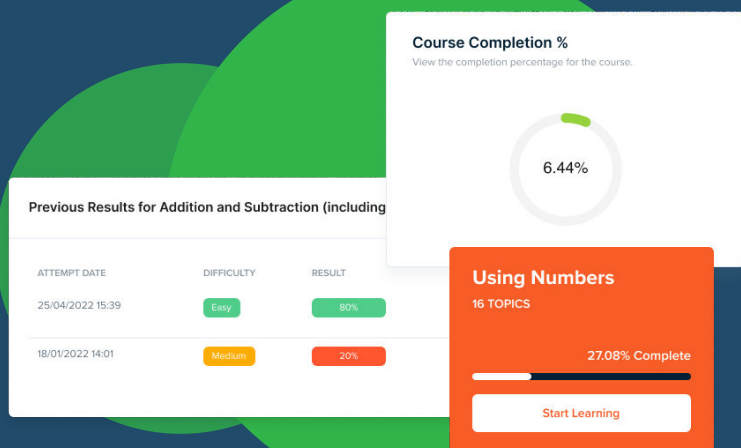
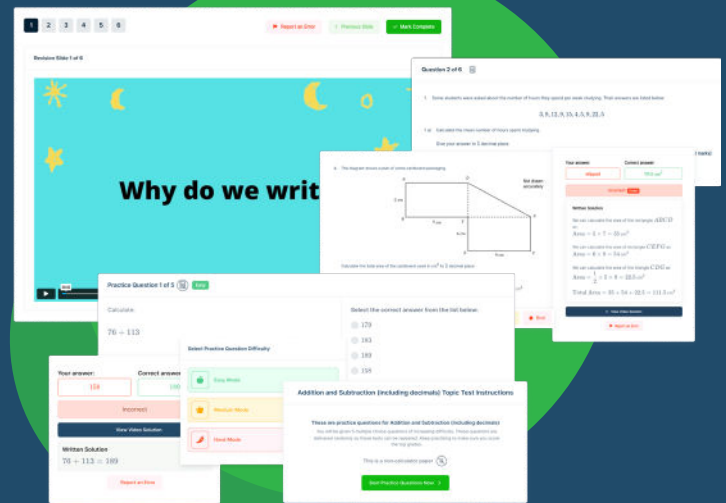


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Past Paper

Activity 2: Basketball

- 2 (a)** Lottie plays basketball.
She does some shooting practice.
She takes 75 shots.
33 of these shots go in the basket.



What percentage of her shots go in the basket?

[2 marks]

$$\frac{33}{75} \times 100 = 44\%$$

Your answer:

44 %

Please turn over



2 (b)

The table shows the number of points Lottie scored in Games 7 to 12 this season.

Her median score for these games is 25% higher than her median for Games 1 to 6.

Game	7	8	9	10	11	12
Score	6	10	6	14	12	10

After Game 6, Lottie's Dad said that he would increase the money in her money box by 20% each time she scored more than her median for the first six games.

Lottie started with £50 in her money box.

How much money will she have after Game 12?

[5 marks]

$$\text{Median (Games 7-12)} = 10$$

$$\text{Median (Games 1-6)} = \frac{10}{1.25} = 8$$

4 games scoring more than 8 points.

$$£50 \times 1.2^4 = £103.68$$

Your answer:

£ 103.68

2 (c)

A player's True Shooting Percentage (TS%) for a game is calculated using the following formula:

$$TS\% = \frac{50P}{0.44F + A}$$

Where: P = total points scored

F = number of free throw attempts

A = number of other goal attempts

In her last game of the season, Lottie:

- scored a total of 15 points
- attempted 8 free throws
- made 17 other goal attempts.

Use the rule to calculate Lottie's TS% for this game.

[2 marks]

$$\frac{50 \times 15}{(0.44 \times 8) + 17} = 36.55\%$$

Your answer:

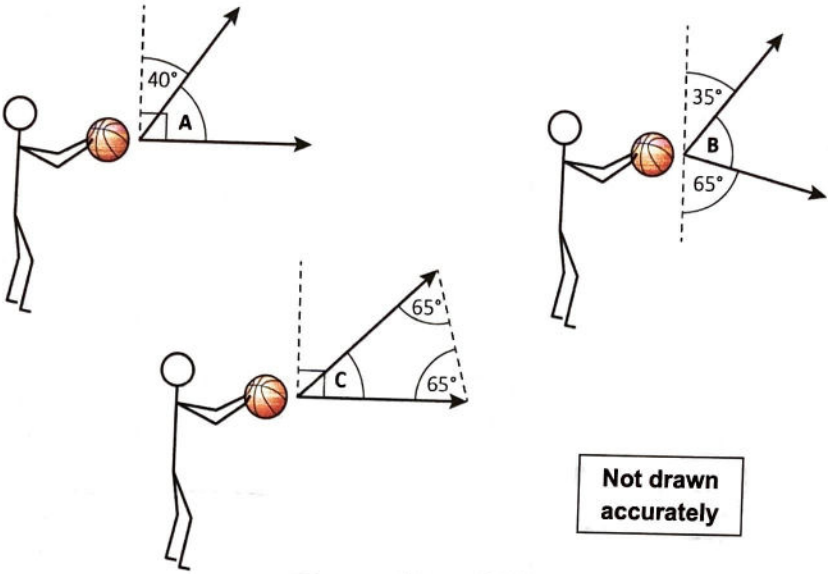
36.55%



2 (d)

Lottie reads that the best angle to launch the ball from for free throws is 50°

Calculate the angles A, B and C.



Not drawn accurately

Tick the ones which are 50°

[1 mark]

Space for your workings:

Your answer:

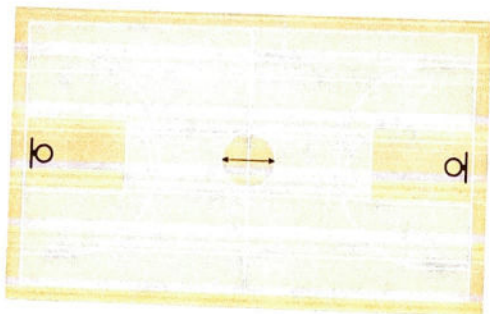
A

B

C

2 (e) This is a scale drawing of a basketball court.

The scale is 1 : 400



The diameter of the centre circle on the diagram is 0.9 cm

Work out the actual area of the centre circle in m^2

Use $\pi = 3.14$

[3 marks]

$$0.9 \rightarrow 0.45 \text{ cm radius}$$

$$0.45 \times 400 = 180 \text{ cm} = 1.8 \text{ m}.$$

$$3.14 \times 1.8^2 = 10.1736 \text{ m}^2$$

Your answer:

10.1736

m^2

2 (f)

There are 15 players in Lottie's basketball team.

The table shows information about the players:

		Height (m)		
		under 1.65 m	1.65 to 1.8 m	over 1.80 m
Usual position on court	Centre	0	2	2
	Forward	0	5	3
	Guard	2	1	0

The coach chooses a forward at random to take a shot.

What is the probability that the player chosen is over 1.8 m tall?

Give your answer as a fraction **and** as a decimal.

[2 marks]

$$\frac{3}{3+5} = \frac{3}{8}$$

Your answer:

Fraction:

~~3/15~~ $\frac{3}{8}$

Decimal:

0.375

[Total marks: 15]

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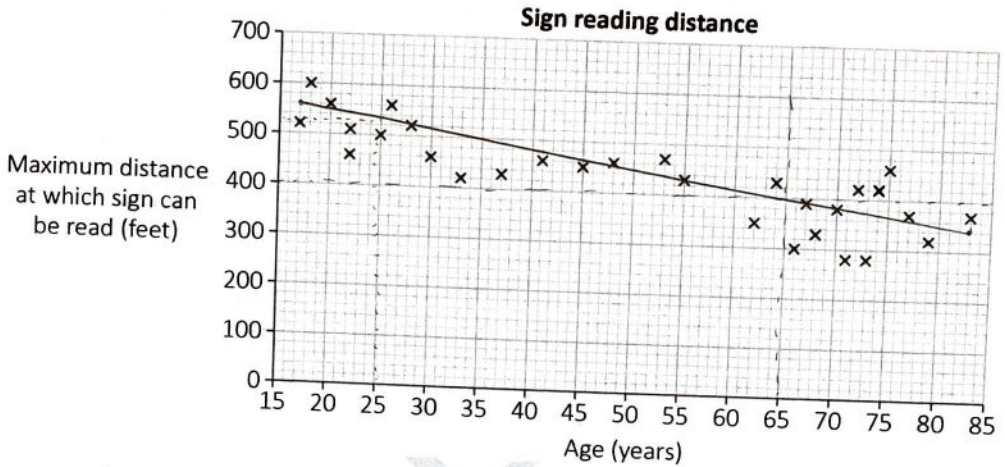
Past Paper



Activity 3: Road safety

- 3 (a)** Jed is 65 years old.
He drives a car but thinks his eyesight is not as good as it was.

The scatter diagram shows the relationship between the ages of drivers and the maximum distances at which they can read road signs.



What fraction of the drivers over 65 can read a road sign at over 400 feet?

[3 marks]

$$\frac{3}{12} = \frac{1}{4}$$

Your answer:

$\frac{1}{4}$

3 (b)

Jed says,

"Using the scatter diagram, I predict that between the ages of 25 and 65 the maximum distance at which people can read a sign reduces by over 50 metres"

Is Jed's prediction reasonable?

Use the scatter diagram in 3 (a) to show how you decide.

Use the conversion: 1 metre = 3.28 feet

[5 marks]

$$25 \rightarrow 530 \text{ ft.}$$

$$65 \rightarrow 400 \text{ ft.}$$

$$\begin{aligned} 530 - 400 \\ = 130 \text{ ft} \end{aligned}$$

$$\frac{130 \text{ ft}}{3.28} = 39.63 \text{ m.}$$

No.

Your answer:

Please turn over



3 (c)

A Department of Transport survey collected data on the percentages of cars travelling at different speeds on a motorway.

The table shows the results of this survey:

Speed (mph)	Percentage of cars
$40 \leq \text{speed} < 50$	4
$50 \leq \text{speed} < 60$	13
$60 \leq \text{speed} < 70$	36
$70 \leq \text{speed} < 90$	47

Work out an estimate for the mean speed.

[2 marks]

$$(45 \times 4) + (55 \times 13) + (65 \times 36) + (80 \times 47)$$

$$= 6995$$

$$\frac{6995}{4+13+36+47} = \frac{6995}{100} = 69.95 \text{ mph (avg).}$$

Your answer:

69.95

mph

3 (d)

Some drivers driving over the speed limit are invited to go to a Speed Awareness Course instead of getting penalty points.

There is a maximum speed at which a person can drive and be invited to a Speed Awareness Course.

This speed is given by this formula:

$$M = 1.1L + 9$$

Where:

M is speed in miles per hour

L is the speed limit

Calculate M when $L = 30$ miles per hour.

[1 mark]

$$(30 \times 1.1) + 9 = 33 + 9 =$$

Your answer:

42



3 (e)

The table shows the number of people attending Speed Awareness Courses each year from 2014 to 2018:

Year	Total number of people
2014	1 355 796
2015	1 403 555
2016	1 390 880
2017	1 413 598
2018	1 445 817

Jed says the mean number of people attending each year for 2017 and 2018 is over 3% percent higher than the mean number for 2014 to 2016.

Is Jed right?

Show how you decide.

[4 marks]

$$\begin{aligned}
 2014 - 2016: & \quad \frac{1355796 + 1403555 + 1390880}{3} \\
 & = 1383410.3 \\
 2017 - 2018: & \quad \frac{1413598 + 1445817}{2} = 1429707.5 \\
 & \frac{1429707.5 - 1383410.3}{1383410.3} \times 100 = 3.347\%
 \end{aligned}$$

Your answer:

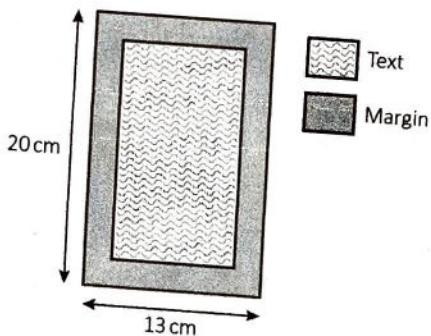
Yes.

[Total marks: 15]

Activity 4: Printing

- 4 (a) Rani is on placement at a printing company.
The company has an order for some leaflets.

Each page will have a rectangular area of text with a 2 cm margin around it.



The printer can fit an average of 3.9 words of text per cm^2

There are 2000 words in total.

What is the minimum number of pages that the printer needs?

You **must** show your working.

[4 marks]

$$20 - (2 \times 2) = 16 \text{ cm}$$

$$13 - (2 \times 2) = 9 \text{ cm}$$

$$16 \text{ cm} \times 9 \text{ cm} = 144 \text{ cm}^2$$

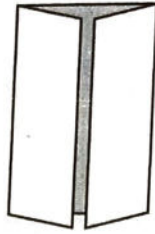
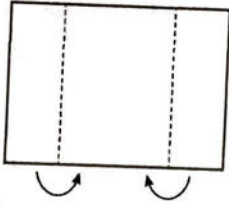
$$144 \times 3.9 = 561.6 \text{ words per page}$$

$$\frac{2000}{561.6} = 3.561 \rightarrow 4$$

Your answer:

4.

4 (b) Another leaflet is folded like this.



What is the maximum number of printed pages the leaflet can have?

[1 mark]

Your answer:

6

- 4 (c) The printer offers two discounts.

Offer A

Buy 2 boxes of leaflets,
get the third box half price

Offer B

5% off the total price

A customer wants to buy three boxes of leaflets.

Which offer is cheaper for the customer?

Show how you decide.

[2 marks]

$$A: \frac{2.5}{3} = 0.8\bar{3} \quad , \quad B: 1 - 0.05 = 0.95$$

Your answer:

A

Please turn over



- 4 (d) Rani is asked to work out the average number of orders per month last year.

The table shows the number of orders each month.

Month	1	2	3	4	5	6	7	8	9	10	11	12
Number of orders	180	182	129	146	138	45	45	125	148	132	195	202

Work out both the median **and** the mode for Rani **and** give one reason why the median is the better average for her to use.

[4 marks]

45, 45, 125, 129, 132, 138, 146, 148, 180, 182, 195, 202

$$\Rightarrow \text{Median} = \frac{138 + 146}{2} = 142$$

$$\text{Mode} = 45$$

The mode is far too low to accurately represent the data.

Your answer:

$$\text{Median} = 142, \text{ Mode} = 45$$

4 (e)

The company's income in 2019 was £863 490

This was 7% higher than in 2018

Work out the company's income in 2018

[2 marks]

$$\frac{£863490}{1.07} = £807000$$

Your answer:

£ 807000



4 (f) The company also prints t-shirts.

$\frac{2}{11}$ of the t-shirts are white.

$\frac{1}{3}$ of the remaining t-shirts are black.

What is the ratio of white : black t-shirts?

[2 marks]

$$\frac{2}{11} \text{ white} \rightarrow \frac{9}{11} \text{ not white.}$$

$$\rightarrow \frac{3}{11} \text{ black.}$$

$$\frac{2}{11} : \frac{3}{11} \Rightarrow 2:3$$

Your answer:

2:3

[Total marks: 15]

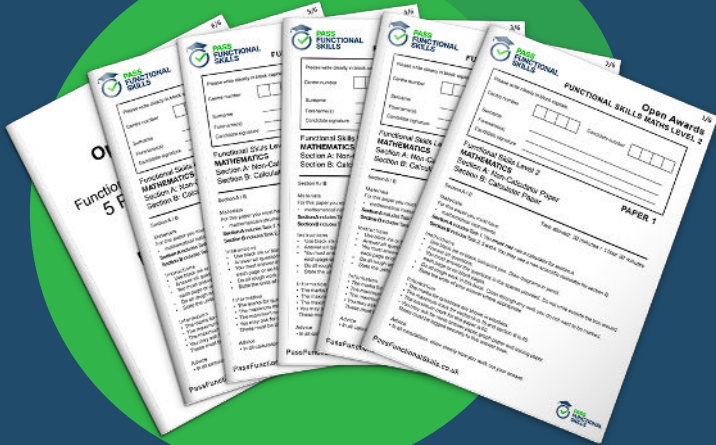
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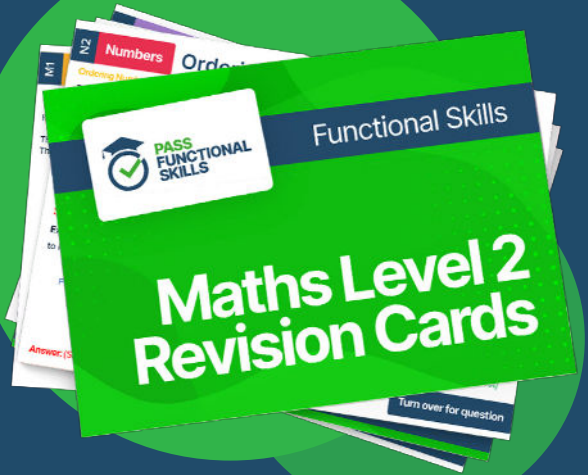
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