ncfe.

Sample Paper: P000292

NCFE Functional Skills Qualification in Mathematics at Level 2 (501/2324/5)

Time Allowed   2 HOURS

You **need** the following to complete this assessment:

- ruler
- calculator
- protractor.

Read each document and activity carefully and attempt to answer **all** activities.

Write your answers in the spaces provided and ensure that your writing is legible.

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

At the end of the assessment hand all documents over to the invigilator as instructed.

DO NOT TURN OVER UNTIL YOU ARE INSTRUCTED TO DO SO BY THE INVIGILATOR.

For Examiner use only:

Activity number	1	2	3	Total
Total Marks awarded				
Total Marks available	10	16	14	40

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Level 2 Practice Papers
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MME
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FUNCTIONAL SKILLS MATHS LEVEL 2
PAPER 1

Please write clearly in block capitals.

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

Surname _____

Forename(s) _____

Candidate signature _____

Functional Skills Level 2
MATHEMATICS
(8362)

Section 1: Non-Calculator Paper

Paper 1   Time allowed: 30 minutes

Materials
For this paper you must have:
• mathematical instruments.
You must not use a calculator.

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 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 20.
• You may ask for more answer paper, graph paper must be tagged securely to this answer book.

Advice
• In all calculations, show clearly how you work

INCLUDES 20 FULL PAPERS & ANSWERS

MME.

Marathon

A marathon is a long-distance running event. Marathons are often held on roads in cities.
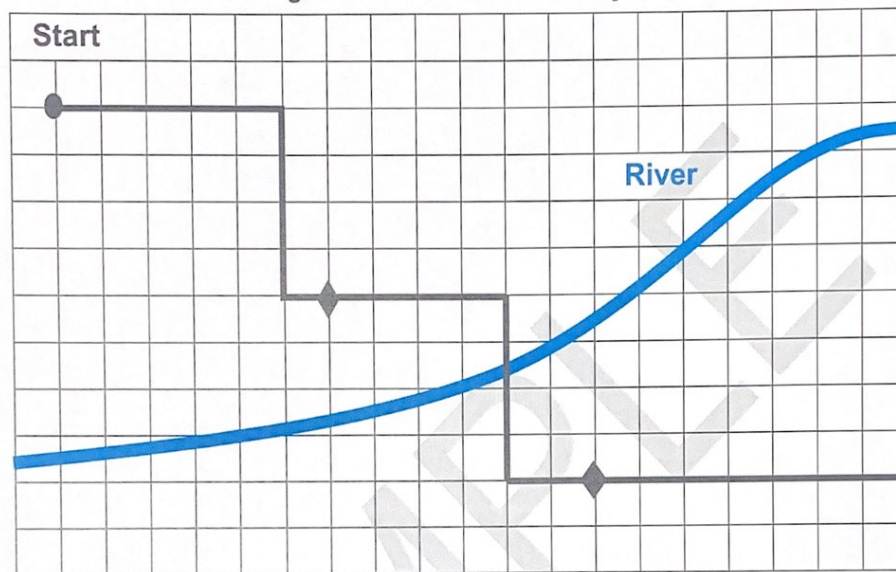
This assessment is about:

- the route of the marathon
- the competitors.

Complete activities 1, 2 and 3 based on the documents provided for each activity.

Activity 1

Task A

Route diagram for the start of the City Marathon

The side of 1 square represents a distance of 0.5 miles.

◆ = Drink Stations

▬ = Route

The start of the route for the City Marathon is shown. The sponsors have provided Drink Stations to give the competitors a drink during the race.

What is the distance between the 2 Drink Stations along the route shown on the map? Give your answer in kilometres **to 2 decimal places**.

(1 kilometre (km) = 0.6214 mile)

Marks available: 4

You must show your working:

10 sides ✗ 0·5 miles = 5 miles

5 ÷ 0·6214 = 8·05 km (2dp)

Your answer:

8·05 km

Task B

The last Drink Station will be 1800 metres (m) from the end of the course.

What is this distance in kilometres?

Marks available: 2
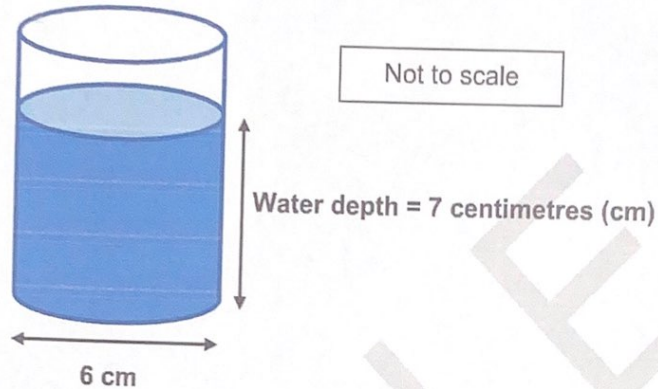
You must show your working:

1800 ÷ 1000 = 1·8 km

Your answer:

1·8 km

Task C

Water is also available to competitors at regular points around the course.

It is given in cylindrical paper cups, like the one shown here.

Not to scale

Water depth = 7 centimetres (cm)

6 cm

The volume of a cylinder is given by the formula:

Volume = $\pi r^2 h$

r is the radius, **h** is the height of the cylinder. For π use 3.14

1 millilitre (ml) is equal to 1 cubic centimetre.

What is the volume of water in the cup?

Marks available: 4

You must show your working:

radius = 6 ÷ 2 = 3cm

Volume = 3.14 × 3² × 7 = 197.82cm3
= 198ml (3sf)

Your answer:

198ml

Total marks available: 10

Activity 2

Task A

The marathon has competitors in 3 different categories: Standard, Elite and Wheelchair.

The table shows the amount of money expected to be raised. Money is raised from charity collections and entry fees.

Category	Standard	Elite	Wheelchair	Totals
Expected Income	£50,000	£5,000	£10,000	£65,000
Number of Competitors	640	120	40	800

What fraction of the total number of competitors are Standard runners? Show your answer as a fraction **in its simplest form**.

Marks available: 3

You must show your working:

$$\frac{640}{800} = \frac{64}{80} = \frac{4}{5}$$

Your answer:

$$\frac{4}{5}$$

Task B

The table shows the amount of money to be raised and the number of competitors.

Category	Standard	Elite	Wheelchair		Totals
Expected Income	£50,000	£5,000	£10,000		£65,000
Number of Competitors	640	120	40		800

The costs of running the event will be £12,000

The final donation to charity will be the amount of the Expected Income left after paying for the costs of the event.

What will the charity donation be as a percentage of this Expected Income? Show your answer **to the nearest whole number**.

Marks available: 3

You must show your working:

£65000 − £12000 = £53000

$\frac{53000}{65000}$ × 100 = 81.538...

= 82%

(nearest whole number)

Your answer:

82%

Task C

1.   The St John's Ambulance service will attend the marathon.

They could be asked to help up to $\frac{1}{9}$ of the competitors in the race.

What is $\frac{1}{9}$ as a percentage?

Marks available: 2

You must show your working:

$$\frac{1}{9} \times 100 = 11.111\cdots = 11.11\%$$

Your answer:

11·11 %

2. All competitors have an equal probability that they will need help from a St John's Ambulance first aider.

Category	Standard	Elite	Wheelchair	Total
Number of Competitors	640	120	40	800

What is the probability that the first person to need help will be an Elite competitor?

Marks available: 2

You must show your working:

$$\frac{120}{800} = 0.15$$

Your answer:

0.15

3.   160 volunteers will support the race.

What is the ratio of volunteers to competitors?

Show your answer as a ratio **in its simplest form**.

Marks available: 2

You must show your working:

160 : 800   can be simplified to
1 : 5   (dividing by 160)

Your answer:

1 : 5

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Functional Skills Level 2

MATHEMATICS

(8362)

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INCLUDES
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& ANSWERS

MME.

Task D

The table shows the numbers of competitors for a different marathon in recent years.

	2010	2011	2012
Number of Competitors	412	585	658

The average (mean) number of competitors over the 4 years 2010 to 2013 is 595.

What was the Number of Competitors for 2013?

Marks available: 4

You must show your working:

$595 \times 4 = 2380$

$2380 - (412 + 585 + 658) = 725$

Your answer:

725

Show how you can check your answer:

$\frac{2380}{4} = 595$

Total marks available: 16

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Please turn over for next activity.

Activity 3

Task A

Category	Standard	Elite	Wheelchair	Total
Number of Competitors	640	120	40	800

Show the Number of Competitors for each category in a pie chart.
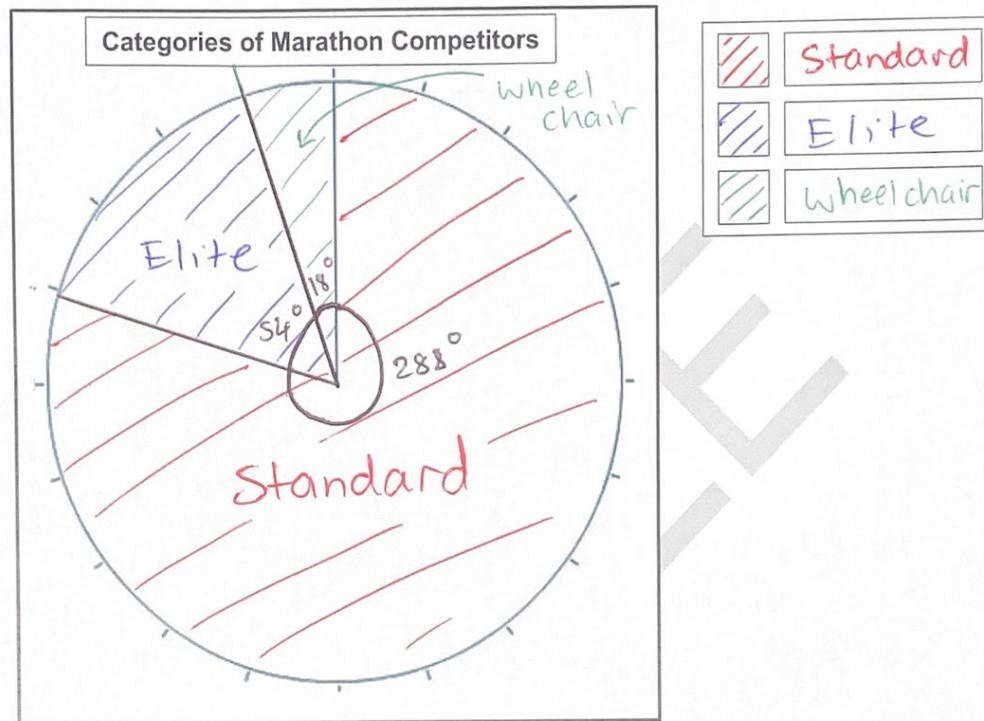
Label the sectors in the chart.

Marks available: 4

You must show your working:

Standard : $\dfrac{640}{800} \times 360° = 288°$

Elite : $\dfrac{120}{800} \times 360° = 54°$

Wheelchair : $\dfrac{40}{800} \times 360° = 18°$

Your answer:

Categories of Marathon Competitors

wheel chair

Elite

18°

54°

288°

Standard

(hatched)	Standard
(hatched)	Elite
(hatched)	Wheelchair

Task B

The fastest Elite competitor in last year's marathon had a race time of 2 hours, 19 minutes and 17 seconds.

The slowest Elite competitor had a time of 2 hours, 32 minutes and 50 seconds.

What is the range of times for Elite competitors?

Marks available: 2

You must show your working:

13 minutes and 33 seconds

(2h 32m 50s − 2h 19m 17s)

Your answer:

13 minutes and 33 seconds

Show how you can check your answer:

2h 19m 17s + 13m 33s = 2h 32m 50s

Task C

The average speed of the fastest competitor in the marathon is 5.12 metres per second.

In training, a competitor ran 20 kilometres (km) in 1 hour, 7 minutes and 37 seconds.

The formula to calculate speed is $v = \dfrac{d}{t}$

v = speed in metres per second, **d** = distance in metres, **t** = time in seconds

Calculate the average speed of the training run, in metres per second. Show your answer **to 2 decimal places**.

Marks available: 5

You must show your working:

1 hour 7 mins 37 seconds = 3600 + 420 + 37
= 4057 seconds

20 km = 20000 m

v = 20000 ÷ 4057 = 4.9297....
= 4.93 m/s (2dp)

Your answer:

4.93 m/s

Compare and comment on the speed of the competitor in training and the average speed of the fastest competitor:

The competitor in training is not as quick as the fastest competitor, since their average speed is less (4.93 < 5.12). They need to improve

Task D

1. The elevation profile shows how high the ground is compared to sea level.

The chart shows how the elevation changes over the course.

Elevation profile for the City Marathon course
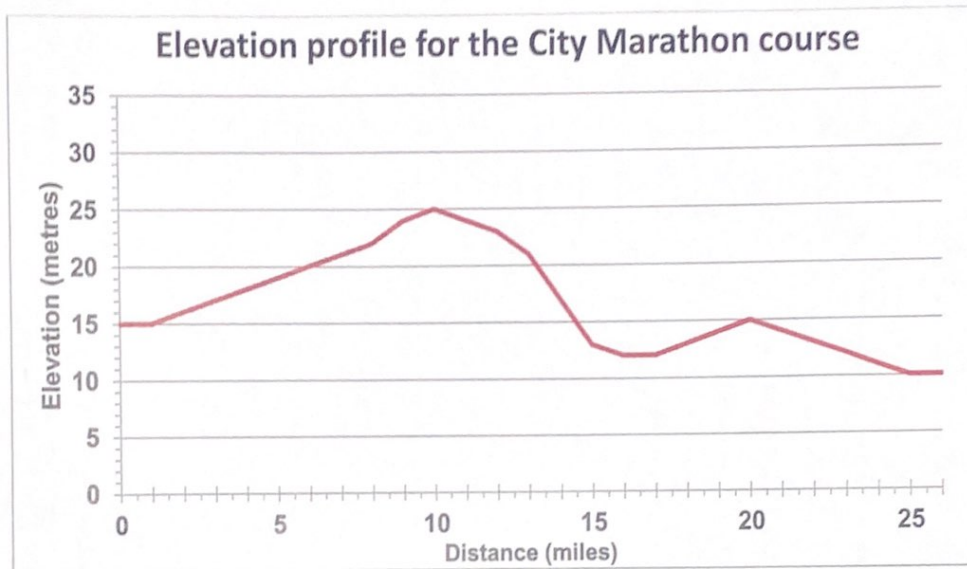
What is the range of the Elevation readings shown on the graph, **in metres**?

Marks available: 2

You must show your working:

25 m – 10m = 15m

Your answer:

15 m

2. For how many miles should competitors expect to be running uphill?

Marks available: 1

You must show your working:

9 + 3 = 12 miles
(where graph goes up)

Your answer:

12

Total marks available: 14

End of assessment