

## **Level 3 Essential Application of Number Skills Sample confirmatory test 3**

Maximum duration: 60 minutes

### **Important note**

This is a sample confirmatory test, developed jointly by the four Essential Skills Wales awarding bodies (Agored Cymru, City & Guilds, Pearson and WJEC).

This sample test provides an indication of the likely format and structure of the live confirmatory tests.

A separate document, containing the answer keys (correct answers) and specification references is also available.

**This confirmatory test consists of 30 multiple choice questions.**

**Questions 1 to 6 are about trains.**

1 A train travels past a signal at a speed of 108 kilometres per hour.

The total length of the train is 270 metres.

How long does the train take to pass the signal?

- a 9 seconds
- b 25 seconds
- c 90 seconds
- d 250 seconds

2 The train takes 25 wagons full of goods to a port twice a day.

Each wagon holds 32 tonnes.

The train runs five days a week for 50 weeks a year.

If the rail line closed, the goods would be carried by lorry.

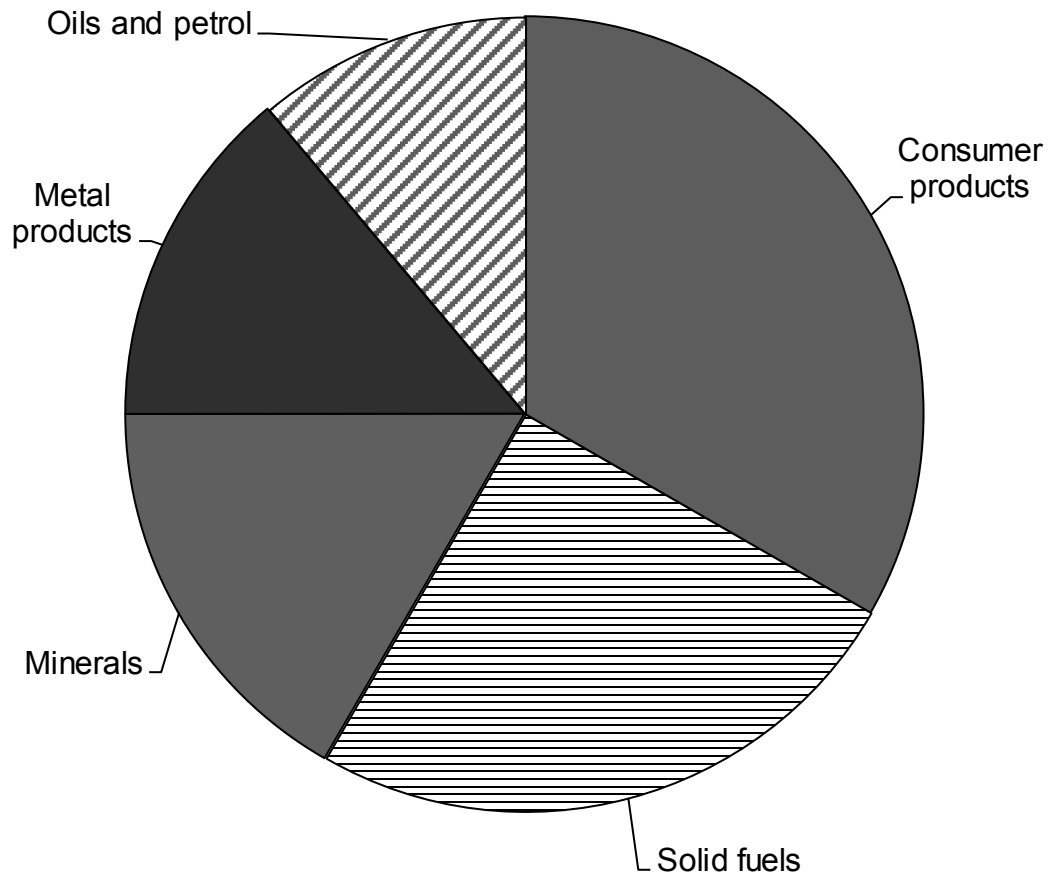
Each lorry takes a 16 tonne load.

How many lorry loads would be needed to transport the goods carried each year by the train?

- a 1 250
- b 2 500
- c 12 500
- d 25 000

3 This pie chart shows the weight of goods carried on a rail line in 2014.

**Goods carried on a rail line, 2014**



The weight of consumer products carried was 7.2 million tonnes.  
The angle of the sector representing consumer products is  $120^\circ$

The angle of the sector representing solid fuels is  $90^\circ$

How many millions of tonnes of solid fuels were carried on the rail line in 2014?

- a 1.8
- b 2.4
- c 5.4
- d 9.6

4 In 2015, 22.2 million tonnes of goods were carried on the rail line.

This is expected to increase by 0.8% per year over the next 5 years.

Which calculation gives the expected weight of goods carried on the rail line in 2020, in millions of tonnes?

- a  $22.2 \times (1.08)^5$
- b  $22.2 \times (1.008)^5$
- c  $22.2 \times 1.08 \times 5$
- d  $22.2 \times 1.008 \times 5$

5 A group of train enthusiasts wants to run an old steam engine on the rail line.

The steam engine is 70 feet 6 inches long.

Use this information:

1 foot = 12 inches  
1 inch is equivalent to 2.5 cm

What is the length of the steam engine in metres?

- a 8.46 m
- b 8.55 m
- c 21.06 m
- d 21.15 m

6 A model of a locomotive is made.

The actual length is 15.0 metres.

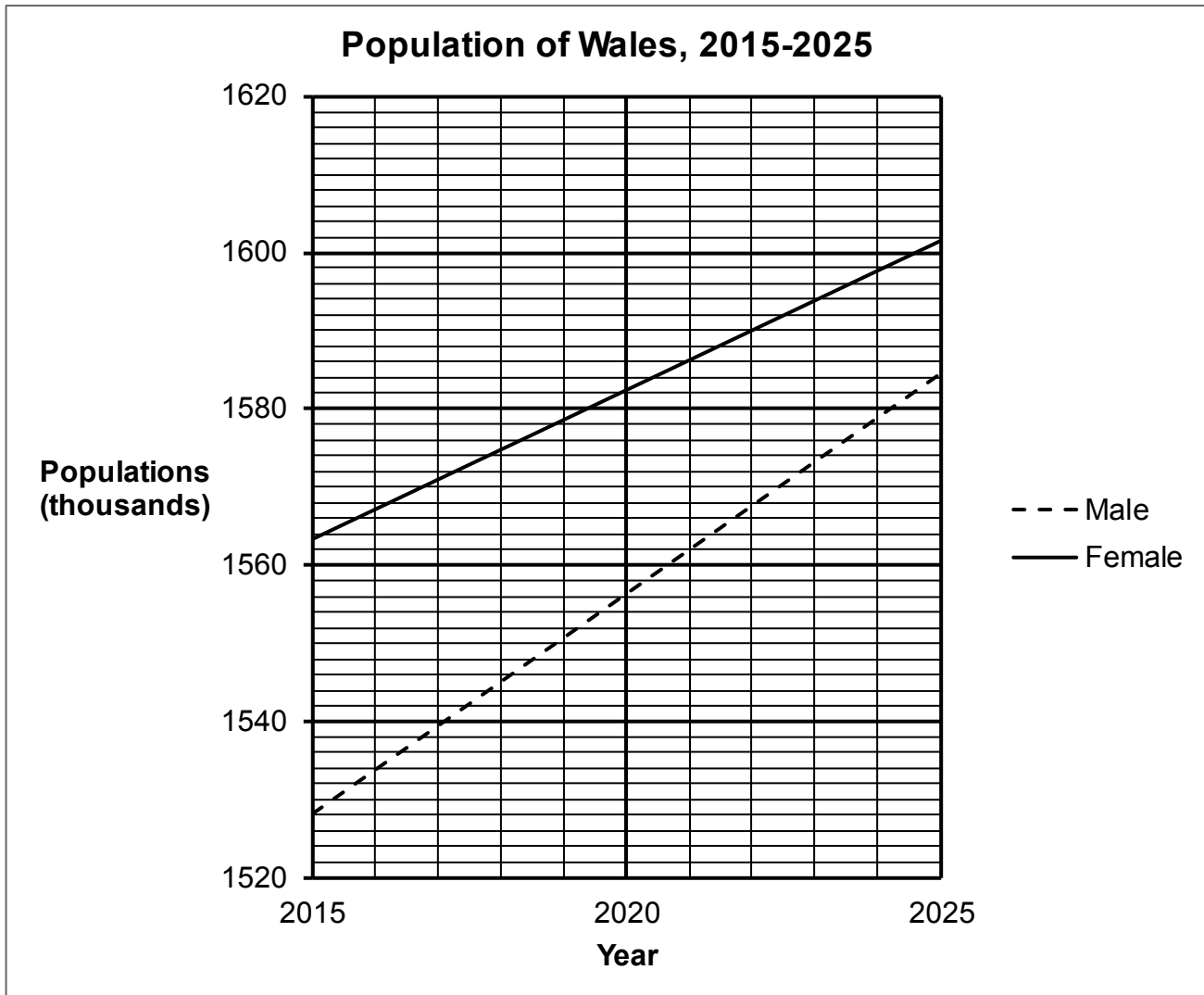
The model has a scale of 1:75

What is the length of the model locomotive?

- a 2 cm
- b 5 cm
- c 20 cm
- d 50 cm

Questions 7 to 10 are about the population of Wales.

7 This graph shows an estimate of the future population of Wales from 2015 to 2025.



In which year is the male population expected to reach 1.57 million?

- a 2016-17
- b 2020-21
- c 2022-23
- d 2023-24

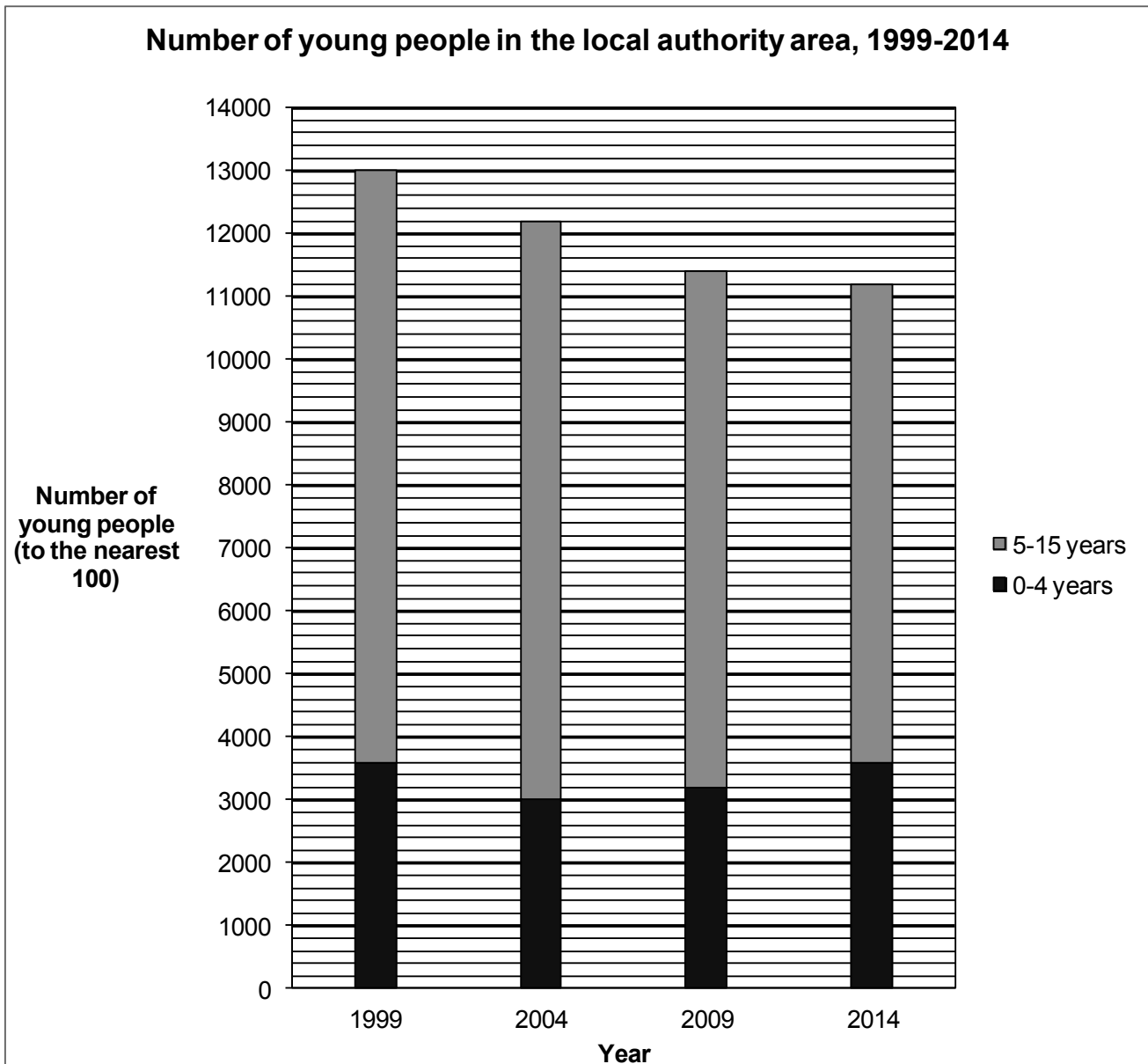
8 The population of a city in Wales in 2004 was  $3.17 \times 10^5$  people.

The population increased by 37 000 people between 2004 and 2014.

What was the population of the city in 2014?

- a 40 170
- b 68 700
- c 354 000
- d 3 207 000

- 9 This graph shows the number of young people in a Welsh local authority area.



Which one of these statements is true?

- a The greatest increase in the number of 0-4 year olds was between 2009 and 2014
- b Between 1999 and 2014, the number of 0-15 year olds decreased by 1400
- c The greatest decrease in the number of 5-15 year olds was between 1999 and 2004
- d There were 3 times as many 5-15 year olds as 0-4 year olds in 2014

- 10 Population density is the average number of people per square kilometre of land.

This table shows the population density of some Welsh local authorities.

<b>Local authority</b>	<b>Population in 2014 (nearest 1000)</b>	<b>Area (to the nearest 10 km<sup>2</sup>)</b>
Monmouthshire	92 000	850
Vale of Glamorgan	128 000	340
Carmarthenshire	185 000	2400
Swansea	241 000	380

Use estimation to select which of these local authorities has the lowest population density.

- a Carmarthenshire
- b Monmouthshire
- c Swansea
- d Vale of Glamorgan



**Questions 11 to 16 are about breakfast cereals.**

11 A manufacturer makes cereal bars.

This formula gives the volume of the package for a cereal bar.

$$V = \frac{Lwh}{2}$$

where  $V$  is the volume in  $\text{cm}^3$   
 $L$  is the length in cm  
 $h$  is the height in cm  
 $w$  is the width in cm

Rearrange the formula to give the length of the package.

a  $L = \frac{V}{2wh}$

b  $L = \frac{2hw}{V}$

c  $L = \frac{wh}{2V}$

d  $L = \frac{2V}{wh}$

12 The company makes a value pack of cereal bars.

The end of the pack has this shape.

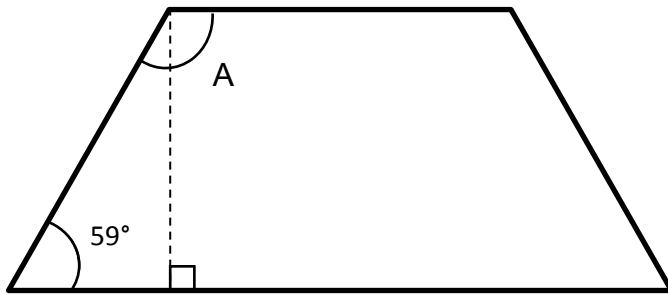


Diagram **NOT** accurately drawn

What is the size of the angle between the top and the sloping side of the shape (angle  $A$  on the diagram)?

- a  $149^\circ$
- b  $121^\circ$
- c  $118^\circ$
- d  $31^\circ$

13 This diagram shows the end of a value pack of cereal bars.

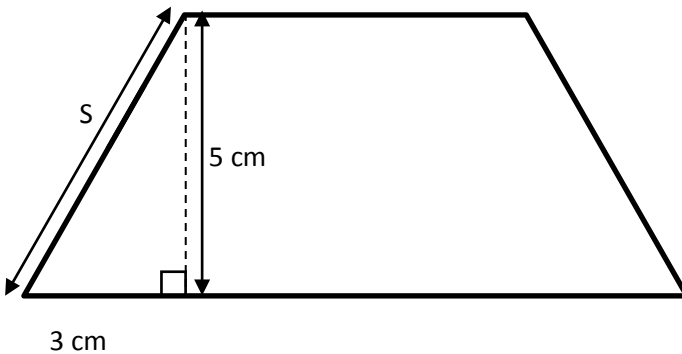


Diagram **NOT** accurately drawn

Which of these gives the length of the sloping side of the shape (side  $S$  on the diagram)?

- a  $\sqrt{5-3}$
- b  $\sqrt{5^2-3^2}$
- c  $\sqrt{5+3}$
- d  $\sqrt{5^2+3^2}$

14 The company sells cereals in a pack with the shape of a cylinder.

This is the formula for the volume of a cylinder.

$$V = \frac{3d^2h}{4}$$

where V is the volume in cm<sup>3</sup>  
d is the diameter in cm  
h is the height in cm

The cereal pack has:

- diameter of 8 cm
- height of 25 cm.

What is the volume of the pack?

- a 300 cm<sup>3</sup>
- b 1200 cm<sup>3</sup>
- c 3600 cm<sup>3</sup>
- d 3750 cm<sup>3</sup>

15 A cereal bar weighs 50 grams.

The sugar content is 18 grams.

A larger cereal bar is made to the same recipe, but with a weight of 60 grams.

What is the sugar content of the 60 gram cereal bar?

- a 19.2 g
- b 21.0 g
- c 21.6 g
- d 28.0 g

- 16 A survey found that the average weekly consumption of breakfast cereals in the UK is  $1.5 \times 10^{-1}$  kilograms per person.

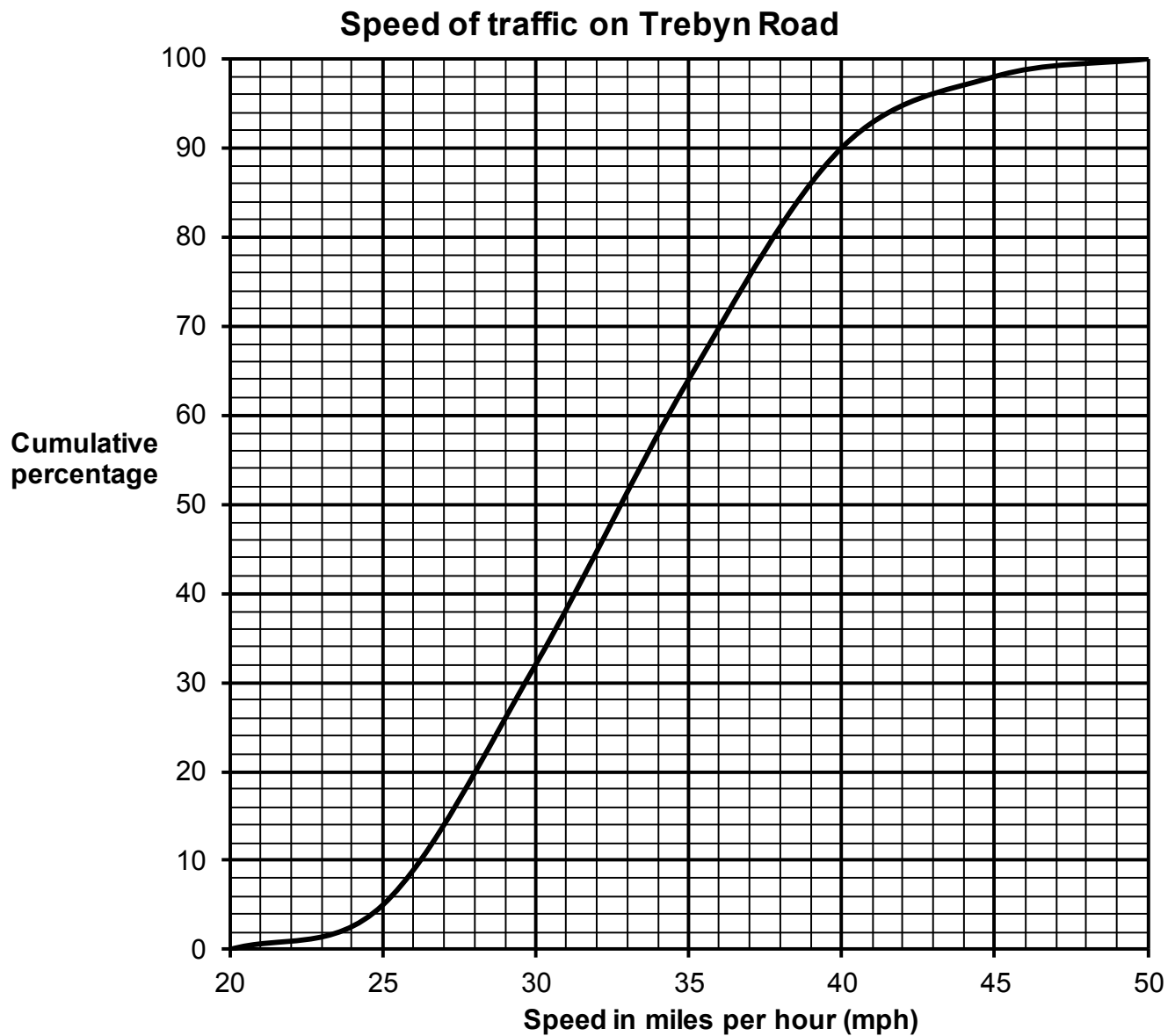
There are  $6.4 \times 10^7$  people in the UK.

If the survey results are accurate, what is the total weekly consumption of breakfast cereals in the UK?

- a  $9.6 \times 10^5$  kg
- b  $9.6 \times 10^6$  kg
- c  $9.6 \times 10^7$  kg
- d  $9.6 \times 10^8$  kg

Questions 17 to 22 are about the speed of traffic on a road.

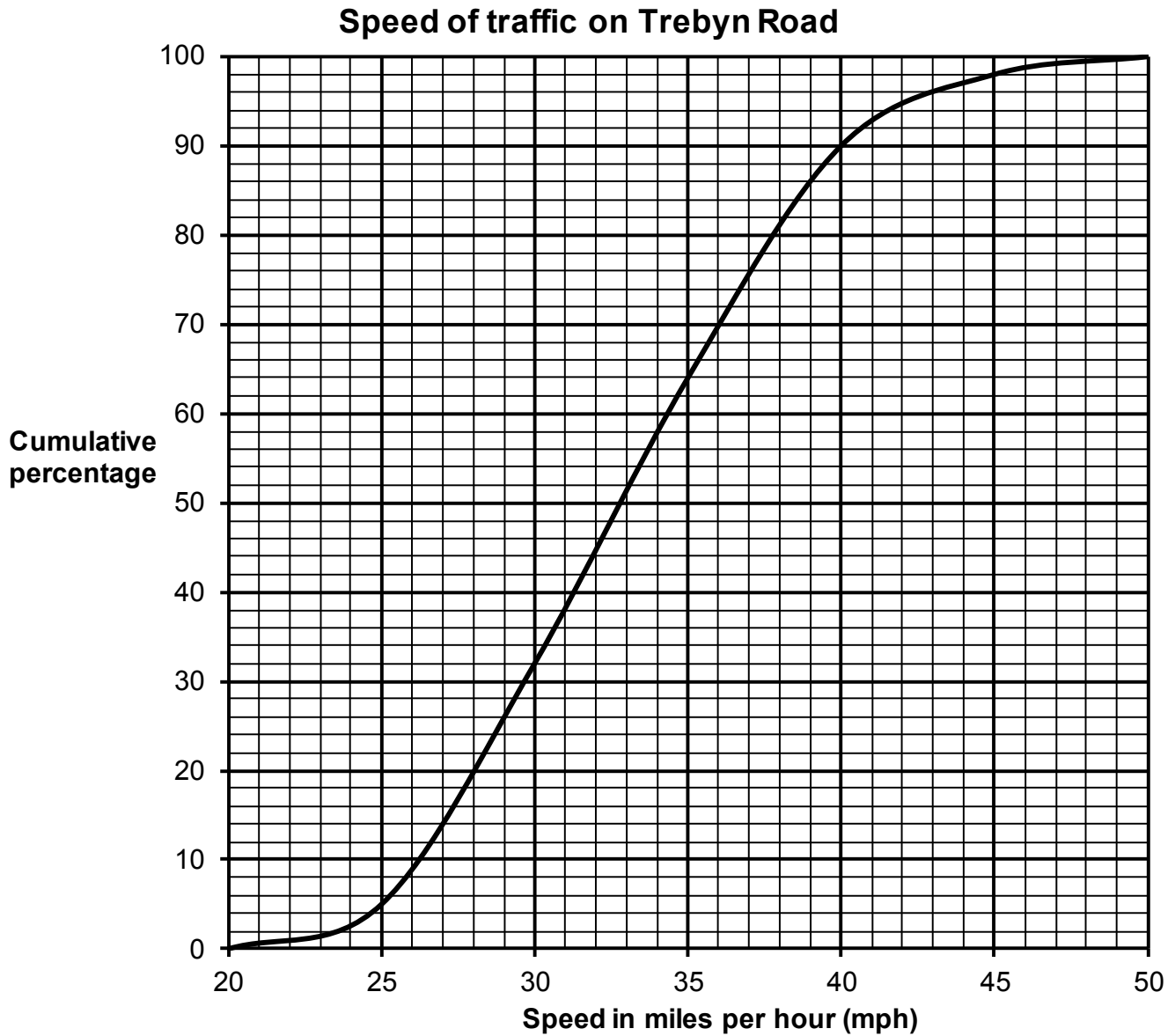
- 17 This cumulative frequency graph shows the results of a survey of the speed of traffic on Trebyn Road.



What percentage of the traffic was travelling at a speed of more than 30 mph?

- a 31%
- b 32%
- c 68%
- d 69%

- 18 This cumulative frequency graph shows the results of a survey of the speed of traffic on Trebyn Road.



Which of these is closest to the interquartile range of the traffic speeds?

- a 8 mph
- b 29 mph
- c 37 mph
- d 79 mph

19 The road is improved and a new survey of traffic speed is carried out.

This table shows the results of the new survey.

<b>Speed (mph)</b>	<b>Percentage of vehicles (%)</b>
15-20	5
20-25	25
26-30	29
31-35	33
36-40	7
41-45	1
46-50	0

In which group is the median speed of the vehicles?

- a 26-30 mph
- b 31-35 mph
- c 36-40 mph
- d 41-45 mph

20 What percentage of the speeds is lower than 31 mph?

- a 29%
- b 33%
- c 59%
- d 92%

21 A stretch of road is 2.4 miles long.

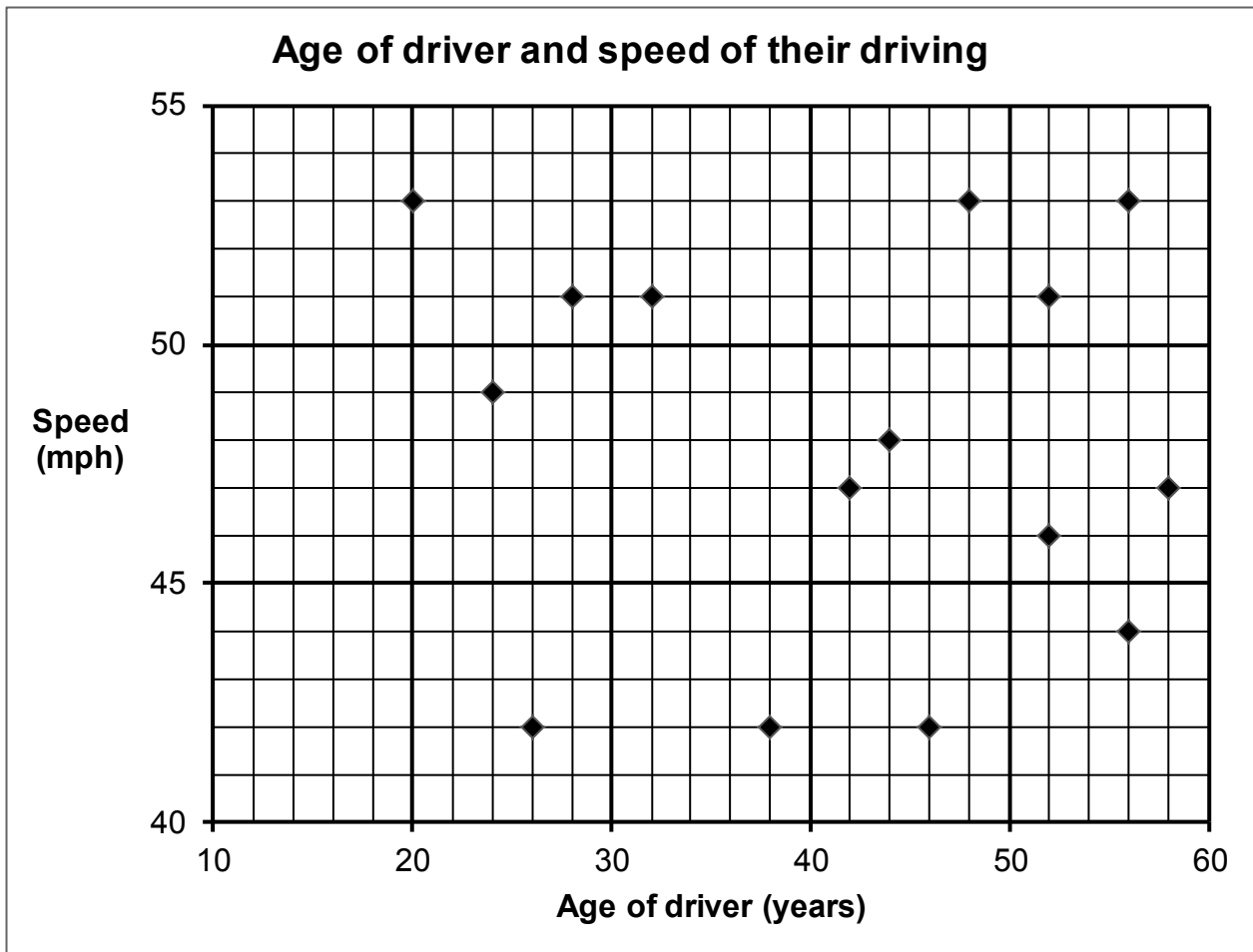
How much longer will it take to drive this distance at 30 mph instead of 40 mph?

- a 1 minute 12 seconds
- b 1 minutes 20 seconds
- c 2 minutes 50 seconds
- d 4 minutes 17 seconds



22 A speed awareness course is arranged for drivers who go too fast.

This scatter graph shows the age and the driving speed of 15 drivers.



What fraction of the drivers on the course were over 40 years old and driving at over 50 mph?

- a  $\frac{3}{5}$
- b  $\frac{2}{5}$
- c  $\frac{1}{3}$
- d  $\frac{1}{5}$

**Questions 23 to 27 are about dairy farming.**

23 On average, Welsh farms produce 1.54 billion litres of milk a year.

There are 220 000 dairy cows on Welsh farms.

1 billion = 1000 million
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What is the average amount of milk per year produced by each cow?

- a 70 000 litres
- b 7 000 litres
- c 700 litres
- d 70 litres

24 The farmer rents a field to graze some cows.

The field has an area of 6 hectares.

The annual rent is £120 per acre.

The farmer uses this information:

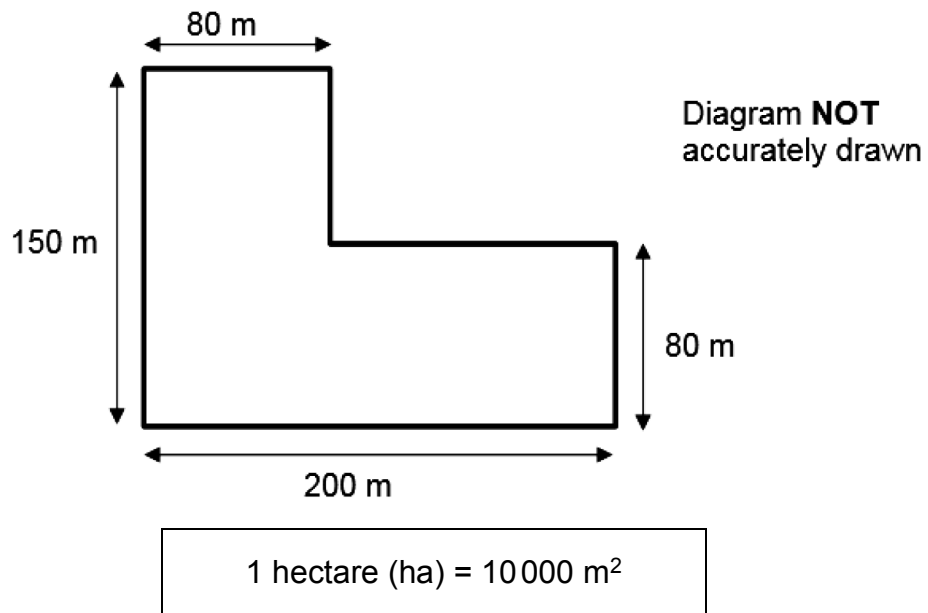
1 hectare is equivalent to 2.5 acres
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What is the total annual rent for the field?

- a £288
- b £1500
- c £1800
- d £2880

25 A farmer works out the area of a field.

This diagram shows the dimensions of the field.



What is the area of the field?

- a 1.52 ha
- b 2.16 ha
- c 2.36 ha
- d 2.80 ha

26 These are the prices of bottles of milk in a shop.

Value Milk	Local Milk
4 pints	2 litres
only £1.00	£1.50

Use this information:

1 litre is equivalent to 1.75 pints

What is the difference in the cost per pint between the two bottles of milk, to the nearest penny?

- a The value milk is 18p per pint cheaper.
- b The local milk is 18p per pint cheaper.
- c The value milk is 25p per pint cheaper.
- d The local milk is 25p per pint cheaper.

27 Every year,  $8.8 \times 10^8$  litres of Welsh milk are processed to make cheese.

It takes 11 litres of milk to make each kilogram of cheese.

1 tonne (t) = 1000 kg

How much cheese is made per year from Welsh milk?

- a 8 000 t
- b 80 000 t
- c 800 000 t
- d 8 000 000 t

**Questions 28 to 30 are about gyms and fitness.**

28 A fitness test involves exercising for a short time and then counting pulse rates.

This formula gives a fitness score:

$$\text{Fitness score} = \frac{100t}{p_1 + p_2 + p_3}$$

where  $t$  is the time of the exercise in seconds

$p_1$  is the pulse rate at the 1<sup>st</sup> count, in beats per minute (bpm)

$p_2$  is the pulse rate at the 2<sup>nd</sup> count, in bpm

$p_3$  is the pulse rate at the 3<sup>rd</sup> count, in bpm

These are a man's pulse rates after exercising:

- 1<sup>st</sup> count, 150 bpm
- 2<sup>nd</sup> count, 130 bpm
- 3<sup>rd</sup> count, 120 bpm.

His fitness score is 80

For how long did the man exercise?

- a 3 minutes 20 seconds
- b 4 minutes 30 seconds
- c 4 minutes 48 seconds
- d 5 minutes 20 seconds

- 29 The man is advised to walk at an average rate of at least 100 steps per minute.

He keeps a record of the time he spends walking and the number of steps he takes in one day.

Time of day	Time spent walking (minutes)	Number of steps
Morning	18	1732
Midday	17	1658

He wants to take a 20 minute walk that evening.

What is the minimum number of steps he must take to achieve an average for the day of 100 steps per minute?

- a 2110
  - b 2210
  - c 2290
  - d 3390
- 30 A study finds that 1 in 8 of the UK population is a gym member.

There are 6000 gyms in the UK.

A gym membership costs on average £20 per month.

There are  $6.4 \times 10^7$  people in the UK.

On average, how much does each gym receive per year in membership fees?

- a £312000
- b £320000
- c £3120000
- d £3200000

### NOW GO BACK AND CHECK YOUR WORK

- **IMPORTANT**

Are the details at the top of the answer sheet correct?

Have you filled in your answers in INK in the appropriate boxes on the answer sheet?