Key skills application of number
Adult numeracy
Level 2
Test Paper

YOU NEED

- This test paper
- An answer sheet
- A ruler marked in mm and cm

You may NOT use a calculator

You may use a bilingual dictionary

You may write on this paper if it helps you to work things out

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Do NOT open this paper until you are told to do so by the supervisor

THERE ARE 40 QUESTIONS IN THIS TEST
Total marks available: 40
Try to answer ALL the questions
YOU HAVE 1 HOUR 15 MINUTES TO FINISH THE TEST

INSTRUCTIONS

- Make sure your personal details are entered correctly on the answer sheet
- Read each question carefully
- Follow the instructions on how to complete the answer sheet
- At the end of the test, hand the test paper, your answer sheet and all notes to the supervisor

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REMEMBER: YOU HAVE 1 HOUR 15 MINUTES TO FINISH THE TEST

INSTRUCTIONS TO CENTRES

- **This paper must not be photocopied**

Questions 1 to 6 are about a woman organising a running race.

1   In last year's race, there were thirty–five thousand runners.
They used 0.7 million bottles of water in total.
The organiser allows the same number of bottles of water **per runner** this year.

How many bottles of water **per runner** does she allow?

A   2
B   20
C   200
D 2 000

2   The organiser looks at the time taken by runners in last year's race.

Time taken in hours:minutes:seconds	Number of runners
Under 2:30:00	65
Between 2:30:00 and 3:29:59	4 383
Between 3:30:00 and 4:29:59	13 898
Between 4:30:00 and 5:29:59	11 720
Between 5:30:00 and 6:29:59	3 476
6:30:00 or over	1 458

How many runners finished the race in **under** $4\frac{1}{2}$ hours?

A   11 720
B   13 898
C   16 654
D   18 346

3   The map below shows part of the route of the race.
The starting point is at A.
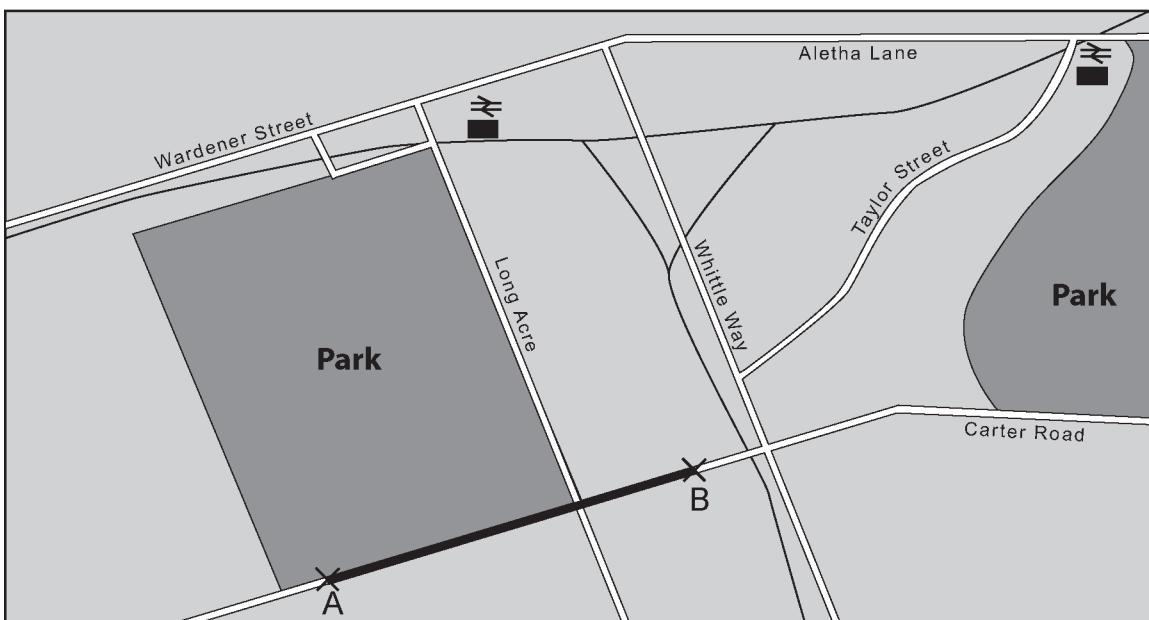
scale 1 : 25000

What is the actual distance from point A to point B on the road?

A   200 metres
B   500 metres
C   1 250 metres
D   5 000 metres

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4 The graph shows the height of the route above sea level.

Height of route above sea level
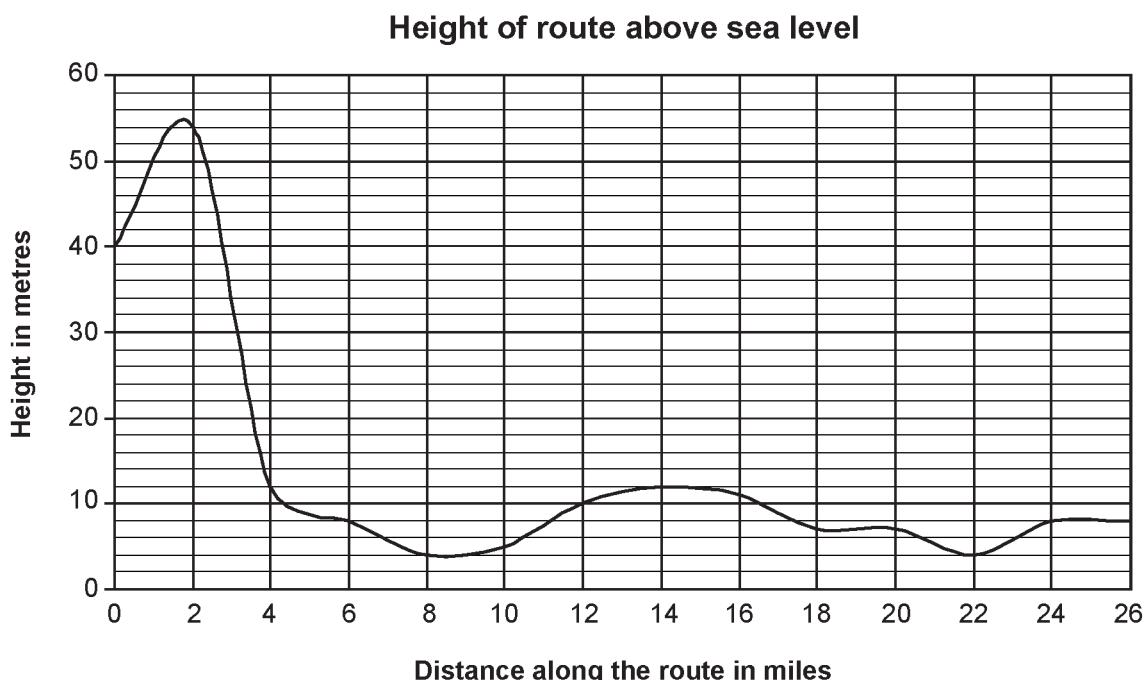
What is the difference in the height of the route above sea level between mile 2 and mile 4?

A 36m
B   41m
C 42m
D 43m

5 The organiser wants to set up 900 toilets for the race.
She plans to put 118 toilets at the start and 106 at the end.
She divides the rest equally between the 13 toilet stops along the route.

How many toilets need to be set up at each toilet stop?

A 49
B 50
C 52
D 55

6   The organiser produces this leaflet showing the entry fees for the race.

Entry fee per runner

Distance of race		26 miles	13 miles	6 miles
Running as an individual	**Member of an athletics club**	£25	£15	£10
	Non-member	£27	£17	£12
Running in a team	**Member of an athletics club**	£21	£12	£7
	Non-member	£23	£14	£9

She receives an entry form for a team of three members of an athletics club who each plan to run 13 miles.

What are the total entry fees for these runners?

A   £36
B   £42
C   £45
D   £63

Please go on to the next page

Questions 7 to 12 are about a farmer.

A farmer wants to make flour from the wheat he grows.

7   He finds the following table on a website selling mills for grinding wheat.

Mills

Model	Height (inches)	Length (inches)	Motor size (horse power)
GMX	65	66	25
GMF	54	56	10
GMA	36	36	5
GMP	63	66	15
GMY	54	56	7.5

The height of the mill must be less than 64 inches.
The length must be less than 66 inches.
The motor size must be **more than** 7.5 horse power.

Which model meets these requirements?

A   GMA
B   GMF
C   GMP
D   GMY

8   The diameter of the mill stone is 30 inches.

2 inches is approximately 5 centimetres

What is the approximate diameter of the mill stone in centimetres?

A   12cm
B   65cm
C   75cm
D   90cm

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9   The mill grinds 450 kilograms of wheat per hour.
The farmer harvests 4 tonnes of wheat from one field.

<div style="border:1px solid black; padding:1em;">

1 tonne is equal to 1 000 kilograms

</div>

Which calculation shows the number of hours it takes to grind this wheat?

A $\dfrac{4 \times 1000}{450}$

B $\dfrac{450 \times 1000}{4}$

C $\dfrac{450 \times 4}{1000}$

D $\dfrac{450}{4 \times 1000}$

10   The 'extraction rate' is the percentage of flour produced from the wheat.
The farmer produces 45 kilograms of flour from every 60 kilograms
of wheat.

What is the extraction rate?

A   27%
B   33%
C   45%
D   75%

11   He packs the flour into bags.
This diagram shows the dimensions of the bags

**Diagram not
to scale**

20cm

Flour

12cm

8cm
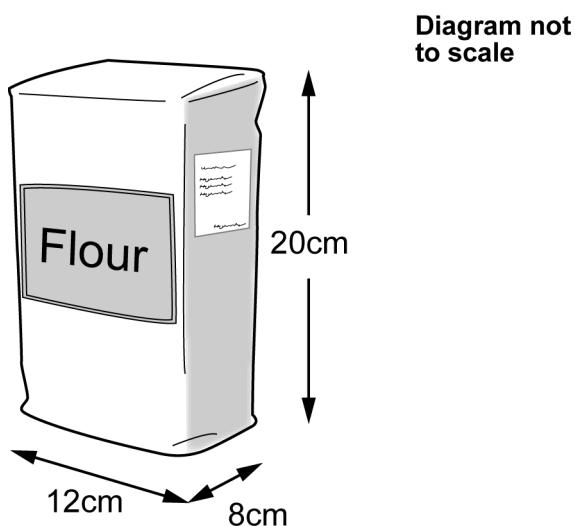
He packs the bags upright into standard packing boxes.
The diagram below shows how the bags fit into the boxes.

**Diagram not
to scale**

42cm

Flour

38cm

20cm
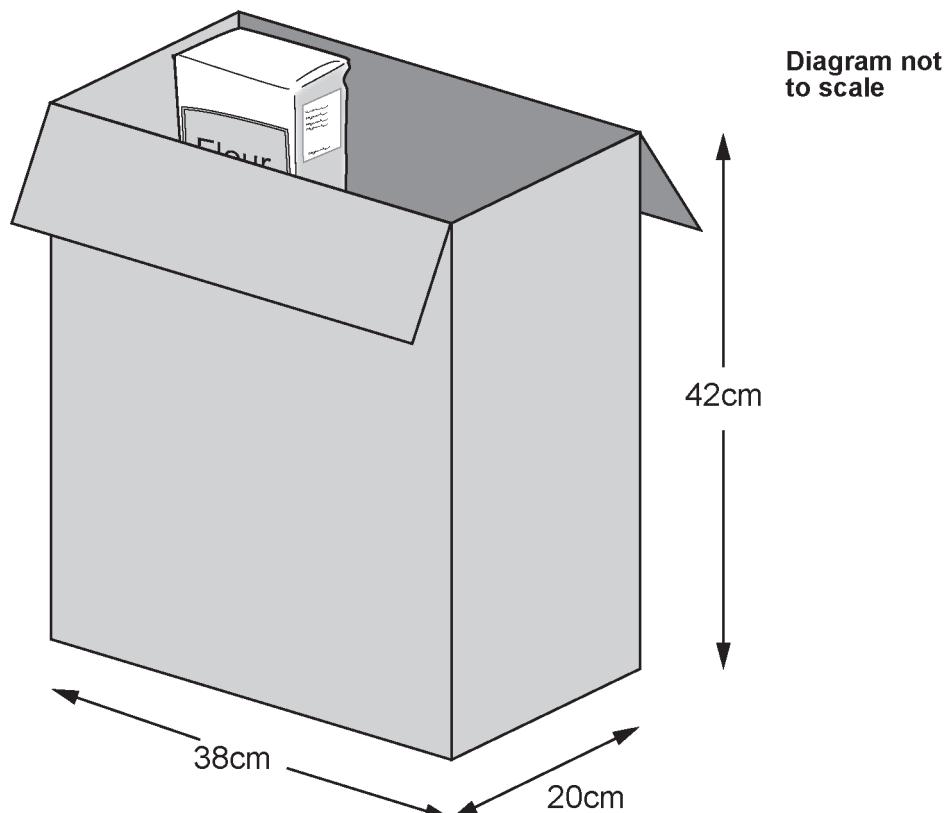
What is the largest number of bags that will fit in each box in this way?

A   7
B   8
C   10
D   12

12 The normal price of a box of flour is £19.60
The farmer gives a trade discount of 15%.
The discount is £2.94

Which of these calculations checks that the discount is correct?

A   2.94 ÷ 100 x 15 = normal price per box
B   2.94 x 100 ÷ 15 = normal price per box
C   2.94 + 100 ÷ 15 = normal price per box
D   2.94 + 100 x 15 = normal price per box

Please go on to the next page

Questions 13 to 17 are about missed appointments at a doctors' surgery.

13   A receptionist wants to display a graph or chart on the surgery notice board showing the numbers of missed appointments each month. She wants to update the display every month.

Which of these displays is the most suitable?

A   a pictogram
B   a scatter graph
C   a flow chart
D   a pie chart

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Questions 14 to 17 use the following table.

Number of doctors' and nurses' appointments missed in 2006													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	**Total**
Doctors	88	94	84	89	87	115	79	86	109	124	94	91	**1140**
Nurses	59	93	110	115	95	100	110	110	97	106	120	85	**1200**
Total	**147**	**187**	**194**	**204**	**182**	**215**	**189**	**196**	**206**	**230**	**214**	**176**	**2340**

14

What is the range in the numbers of **nurses'** appointments missed per month?

A   26
B   59
C   61
D   110

15

What is the difference between the mean number of doctors' appointments missed per month and the mean number of nurses' appointments missed per month?

A   5
B   13
C   16
D   20

16

In January, a total of 147 appointments were missed.
Of these, 59 were nurses' appointments.

Approximately what percentage of the total were nurses' appointments?

A   30%
B   40%
C   50%
D   60%

17

The doctors cost the surgery £30 per hour.
Each appointment is 10 minutes long.
The total number of doctors' appointments missed in 2006 was 1140

What was the cost of the time wasted on missed doctors' appointments in 2006?

A   £3 180
B   £3 700
C   £5 520
D   £5 700

Questions 18 to 23 are about a graphic designer.

18   The designer is working on packaging for tubes of savoury snacks.

He uses this formula to work out the surface area of a small tube

$$S = 6(r^2 + hr)$$

where S = surface area of tube in square centimetres
        r = radius of tube in centimetres
        h = height of tube in centimetres

The tube has a radius of 3cm and a height of 8cm.

What is the surface area of this tube?

A   26cm^2
B   78cm^2
C   180cm^2
D   198cm^2

19   A large tube has a surface area of 280cm^2.
The designer puts a special offer label on the tube.
This label covers an area of 47cm^2.

Approximately what fraction of the surface area of the tube is covered by this label?

A $\frac{1}{7}$

B $\frac{1}{6}$

C $\frac{1}{5}$

D $\frac{1}{4}$

Questions 20 and 21 use the following information.

The designer creates 3 different designs for the tubes of savoury snacks. He asks some people which design they prefer.

He records their answers from his survey on a tally chart.

Design favourites

Preference	Tally
Design 1	卌 卌 卌 ‖
Design 2	卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 ‖
Design 3	卌 卌 卌 卌 卌 卌 ‖‖
No preference	卌 ‖‖

20 How many more people preferred design 2 than preferred design 3?

A 15
B 16
C 17
D 19

21 The designer shows the results of his survey in a pie chart.

Design favourites
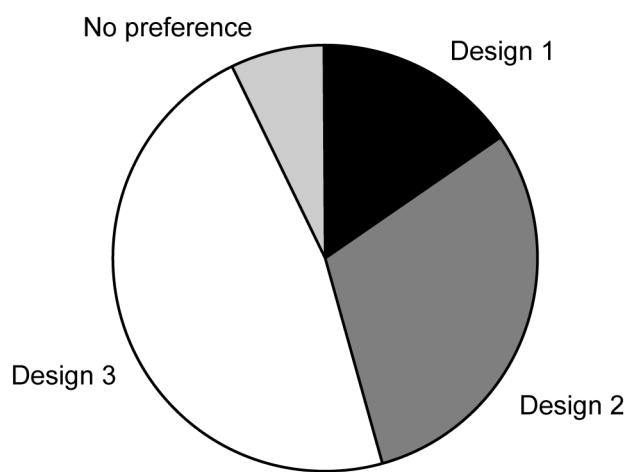
What is wrong with the pie chart?

A There is no key.
B Some of the sectors are the wrong size.
C It needs to show the angles of the pie chart.
D It needs to show the total number of people surveyed.

22 The designer also designs the box for a new toy.
He wants to know the length of the toy in millimetres.
The arrow points to the length of the toy.
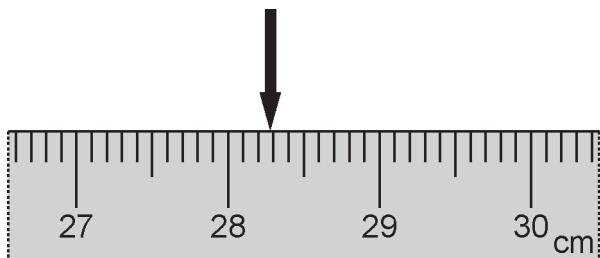
What is the length of the toy to the nearest millimetre?

A 280mm
B 282mm
C 283mm
D 285mm

23 He wants to know the surface area of the box for the toy.
The diagram below shows the end of the box.

Diagram not to scale

All corners are right angles

4cm

8cm

4cm

7cm
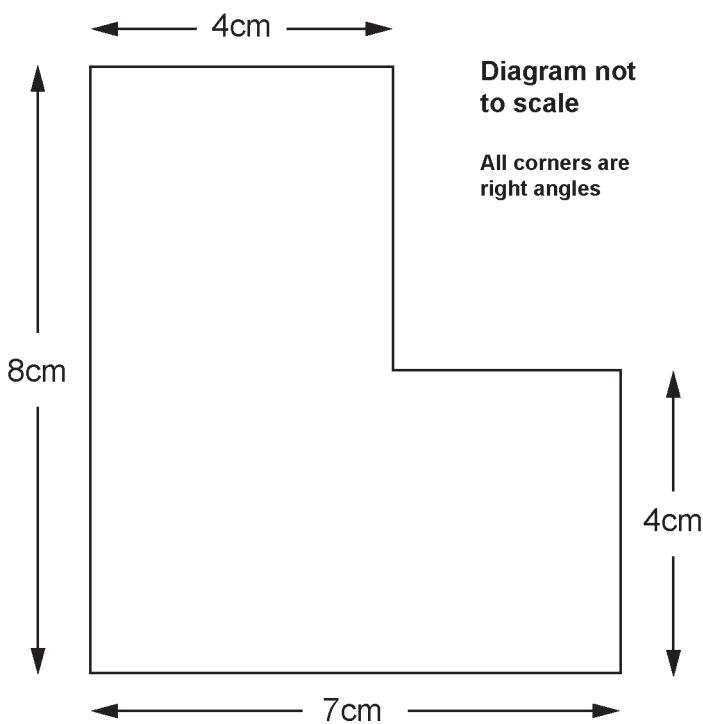
What is the area of the end of the box?

A 23cm^2
B 30cm^2
C 44cm^2
D 60cm^2

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Questions 24 to 28 are about a business trip.

A man plans a business trip from London to Milan (Italy), then from Milan to Phoenix (USA).

24   He looks at a simplified time zone map.
The map shows the difference in times between the UK and other countries.

Time difference
+1 means one hour later than the UK
-1 means one hour earlier than the UK
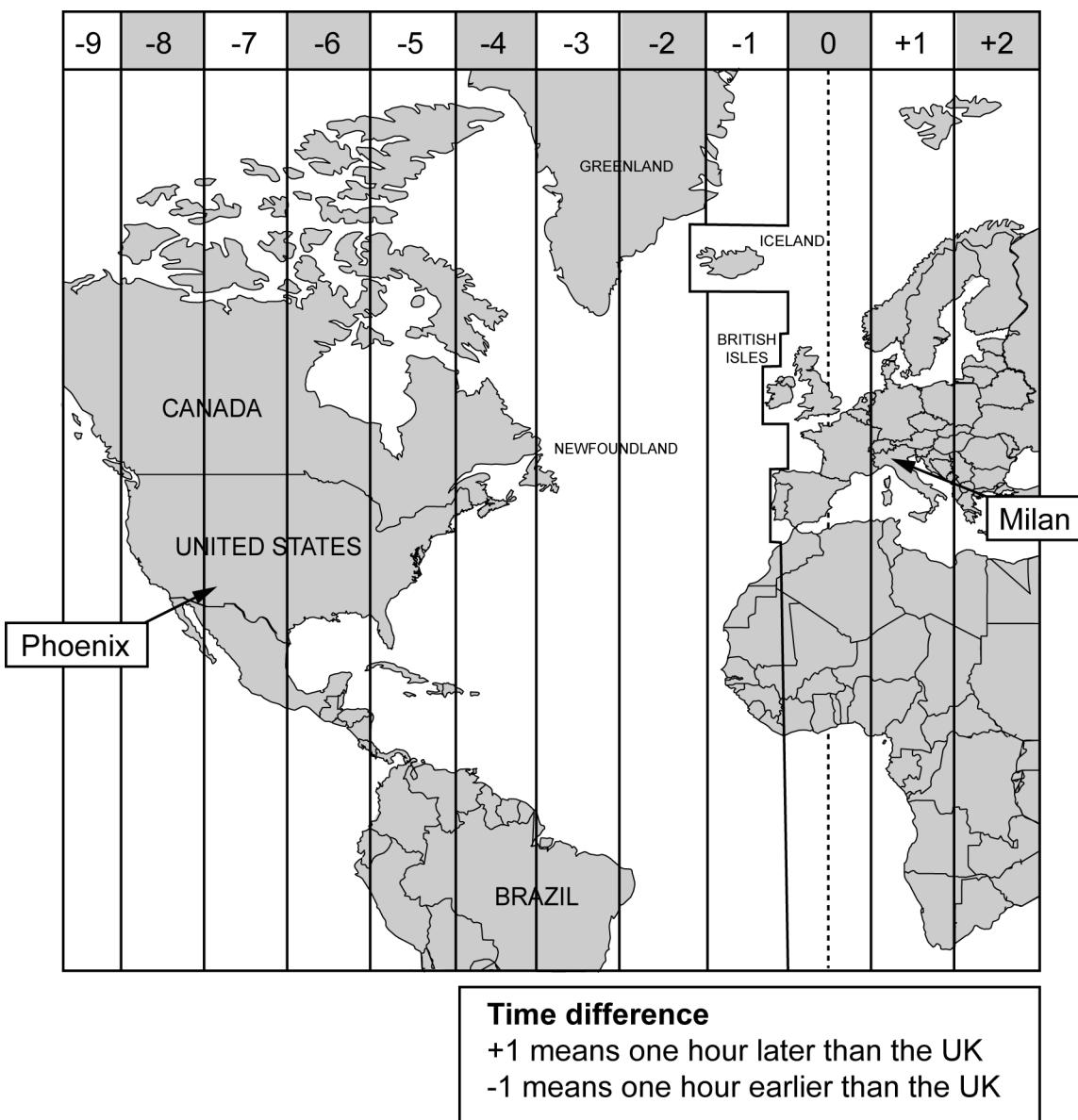
He compares the time in Milan to the time in Phoenix.

According to this map, which statement is correct?

A   The time in Phoenix is 6 hours later than in Milan.
B   The time in Milan is 6 hours later than in Phoenix.
C   The time in Phoenix is 8 hours later than in Milan.
D   The time in Milan is 8 hours later than in Phoenix.

25 Before the man leaves he books his accommodation.

- 3 nights in Milan at £96 per night
- 4 nights in Phoenix at £54 per night

The total cost of his accommodation is

A £494
B £496
C £504
D £512

26 He checks the weight of his luggage on his bathroom scales.
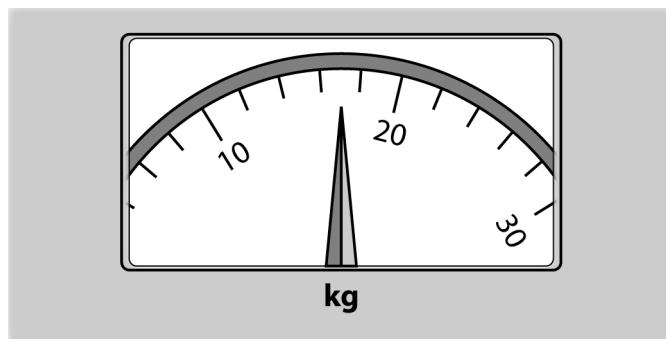
The airline will allow him to take up to 22kg of luggage.

How much more luggage can he take?

A 3.5kg
B 5kg
C 7kg
D 8.5kg

27 The man lives a $\frac{1}{2}$ hour drive from the airport.

He must be at the airport 2 hours before his flight leaves.
He allows an extra 20 minutes to park his car and get to the airport building.
His flight leaves at 15:05

What is the latest time he must leave his house?

A   12:05
B   12:15
C   12:35
D   12:55

28 In Milan he changes 90 euros (€) into American dollars ($).

€ 10 = $ 12

How many dollars does he get?

A $75
B $102
C $108
D $180

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Questions 29 to 34 are about a scientist researching oil production and use.

The table below shows the details of the 11 countries that belong to OPEC
(the Organisation of the Petroleum Exporting Countries)

Country	Oil produced (million barrels per day)	Oil used (million barrels per day)	Population (millions)
Algeria	1.4	0.2	323
Indonesia	1.1	1.2	250
Iran	4.0	1.4	68
Iraq	2.1	0.4	26
Kuwait	2.5	0.3	2
Libya	1.6	0.2	6
Nigeria	2.5	0.3	129
Qatar	0.8	0.1	1
Saudi Arabia	9.5	1.8	26
United Arab Emirates	2.4	0.3	3
Venezuela	3.1	0.5	25

29 What is the median of the **oil produced** per day by these countries?

A   1.6 million barrels
B   2.4 million barrels
C   2.5 million barrels
D   2.8 million barrels

30 What is the range of the **oil used** per day by these countries?

A   0.2 million barrels
B   0.3 million barrels
C   1.7 million barrels
D   1.8 million barrels

31   Indonesia is the only OPEC country that uses more oil than it produces.
It imports the extra oil it needs.

What is the amount it imports as a fraction of the amount it uses?

A $\frac{1}{12}$

B $\frac{1}{11}$

C $\frac{11}{12}$

D $\frac{12}{11}$

32   Saudi Arabia uses more oil than the other OPEC countries.

Which calculation shows how many barrels of oil each person uses
per year in Saudi Arabia?

A $\frac{1.8}{26 \times 365}$

B $\frac{26 \times 365}{1.8}$

C $\frac{26}{1.8 \times 365}$

D $\frac{1.8 \times 365}{26}$

33   The United States of America is the biggest user of oil in the world.
In 2005 it used 20 million barrels per day.
It produced 8 million barrels per day and imported the rest.

What was the ratio of the amount of oil it **produced** to the amount of oil
it **imported**?

A   2 : 3
B   2 : 5
C   3 : 2
D   3 : 5

34 This chart shows the oil reserves of 6 countries

Oil reserves in six countries
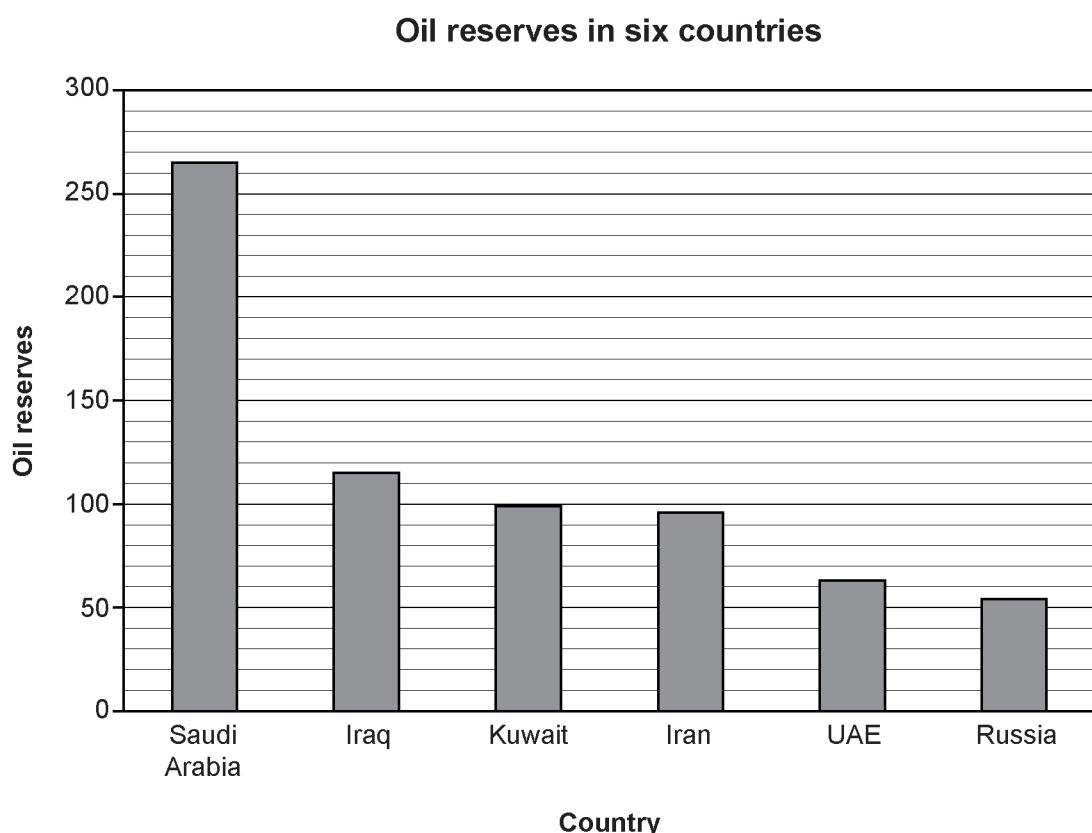
Which of the following statements is correct?

A   Saudi Arabia has more oil reserves than the other countries together.
B   Russia has less than a quarter of the oil reserves of Saudi Arabia.
C   Iraq has more than half the oil reserves of Saudi Arabia.
D   Iran has less than one third of the oil reserves of Saudi Arabia.

Please go on to the next page

Questions 35 to 40 are about a woman who makes paperweights.

35   She makes a paperweight in the shape of a treasure chest.
     The lid on the original design that she uses has a height of 30mm.
     She enlarges the original design in the ratio 2 : 3

     What is the enlarged height of the lid?

     A   18mm
     B   20mm
     C   36mm
     D   45mm

36   This diagram shows the dimensions of the main part of the paperweight
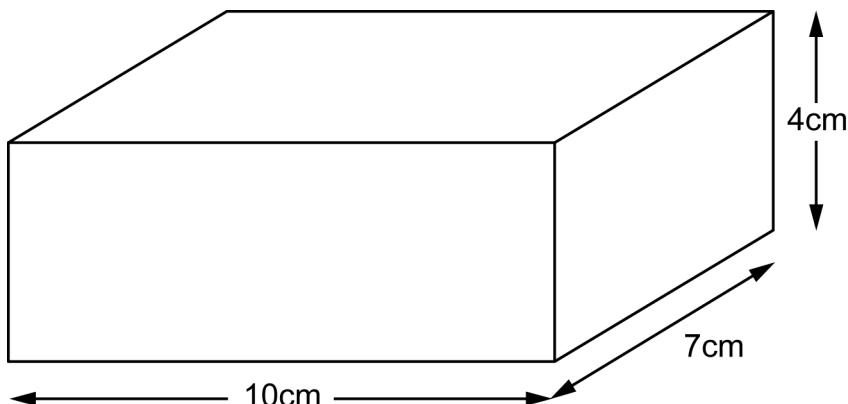
     What is the volume of the main part of the paperweight?

     A   21cm^3
     B   68cm^3
     C   110cm^3
     D   280cm^3

37 To make the paperweights the woman mixes resin with a setting agent following these instructions

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Use 40ml of setting agent per 1kg of resin

How much setting agent does she add to 400 grams of resin?

A   10ml
B   16ml
C   100ml
D   160ml

38 A different design of paperweight uses 625 grams of resin.
She wants to make six of these paperweights.
One tin of resin contains 5 000 grams.

How much resin is left in the tin after she makes the six paperweights?

A   1 250g
B   1 380g
C   2 350g
D   2 750g

39 The woman orders the following items for making paperweights.

- 2 tins of resin costing £31.29 each
- 2 tubes of catalyst costing £3.29 each
- 1 can of PVA releasing agent costing £11.91
- 1 packet of mixing sticks costing £3.58
- 1 tube of pigment costing £4.37

She rounds the prices of each item to the nearest pound. She estimates the total cost of these items.

Her estimate is

A   £84
B   £86
C   £88
D   £93

40 The woman compares sales of different designs of paperweights in a shop and on the internet, using the information in this table

Sales of paperweights

Design	Number of shop sales	Number of internet sales
Design 1	2	0
Design 2	1	1
Design 3	9	8
Design 4	7	7
Design 5	2	0
Design 6	4	3
Design 7	3	2
Total	**28**	**21**

Which design of paperweight has the modal value for shop sales?

A Design 3
B Design 4
C Design 6
D Design 7

End of test

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