

Write your name here

Surname

Other names

Edexcel
Functional Skills

Centre Number

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Candidate Number

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Mathematics

Level 2



18–22 March 2013

Time: 1 hour 30 minutes

Paper Reference

FSM02/01

You must have:

Pen, calculator, HB pencil, eraser, ruler graduated in cm and mm, protractor, compasses.

Total Marks

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My signature confirms that I will not discuss the content of the test with anyone until the end of the 5 day test window.

Signature: _____

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Sign the declaration.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- **Calculators may be used.**

Information

- The total mark for this paper is 48.
- The marks for each question are shown in brackets – *use this as a guide as to how much time to spend on each question.*
- **Where you see this sign you must show clearly how you get your answers because marks will be awarded for your working out.**
- **Check your working and your answers at each stage.**



Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.

Turn over ►

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PEARSON

SECTION A: Castle Abbey

Answer all questions in this section.

Write your answers in the spaces provided.

- 1 Castle Abbey is open to the public.
People can visit the house and the gardens.

Jess wants to visit the gardens at Castle Abbey.
Here are the opening times.



	Times	Mon	Tue	Wed	Thu	Fri	Sat	Sun
House								
19 Feb – 24 Jul	11 – 5			✓	✓	✓	✓	✓
25 Jul – 11 Sep	11 – 5	✓		✓	✓	✓	✓	✓
14 Sep – 30 Oct	11 – 5			✓	✓	✓	✓	✓
Gardens								
1 Jan – 18 Feb	11 – 4				✓	✓	✓	✓
19 Feb – 30 Oct	10 – 5.30	✓	✓	✓	✓	✓	✓	✓
2 Nov – 31 Dec	11 – 4			✓	✓	✓	✓	✓

✓ Open House also open on bank holidays

Jess wants to visit the gardens on a Tuesday in August.

(a) What times are the gardens open on Tuesdays in August?

(1)

Write your answer in the box below.

10 – 5.30 pm



A school is going to take some children to Castle Abbey.
Adults must go on the visit with the children.

The school needs to organise the adults and the children into groups.

- There are 44 children in total.
- Each adult can supervise up to 10 children.
- The maximum group size is 12 people.
- Two children each have their own adult carer.
- These adult carers cannot supervise any other children.

The school wants the smallest number of groups.

(b) Organise the adults and the children into groups for the visit.

(4)

Use the box below to show clearly how you get your answer.



children carers adults
44 2 5

⊙ adults
 $44 \div 10 = 4.4 = 5 \text{ adults}$

	children	adults	carers
Gp 1	10	1	1
Gp 2	10	1	1
Gp 3	10	1	
Gp 4	10	1	
Gp 5	4	1	
	<hr/> 44	<hr/> 5	<hr/> 2

(Total for Question 1 is 5 marks)



2 Lottie plans tours at Castle Abbey.

On Wednesday, 3 groups will tour the house and gardens.

Castle Abbey tours

Tours start at 11:00

The house has 3 floors.

Only one group is allowed on a floor at the same time.

The groups have 20 minutes on each floor.

They can visit the floors in any order.

Each group also does one 30 minute practical activity.

There will be a 45 minute lunch break.

Groups can spend free time in the gardens.

The tours must finish at 14:30

Lottie needs a time plan for the tours on Wednesday.

The time plan must show

- the start time for each group on each floor
- the start time for the practical activity
- the start time for the lunch break
- time spent in the gardens.

Time table { Group

- (a) Make a time plan for the 3 groups for Lottie.
Check that your plan is correct.

(4)

	Gp1	Gp2	Gp3
11.00 - 11.20	F1	F2	F3
11.20 - 11.40	F2	F3	F1
11.40 - 12.00	F3	F1	F2
12 - 12.30	PRAC	PRAC	PRACTICAL
12.30 - 1.15	LUNCH	LUNCH	LUNCH
1.15 - 2.30	GARDEN	GARDEN	GARDEN



Use the box below to show your time plan.



A practical activity at Castle Abbey is making spice bags.

School groups visit on 84 days each year.

Up to 20 children a day each make a spice bag.

Each spice bag uses:

$\frac{1}{4}$ teaspoon cinnamon

$\frac{1}{2}$ teaspoon cloves

$\frac{1}{4}$ teaspoon nutmeg



1 teaspoon of nutmeg = 3 g of nutmeg

Lottie orders 2 kg of nutmeg for next year.

(b) Is 2 kg of nutmeg enough for one year?

(5)

Use the box below to show clearly how you get your answer.



- ① How many spice bags
- ② Weight of nutmegs $\rightarrow \frac{1}{4}$
 \searrow 3g
- ③ Compares to 2kg

$$84 \times 20 = 1680 \text{ bags}$$

$$\frac{1}{4} \times 1680 = 420 \text{ teaspoons}$$

Each teaspoon 3g

$$\text{Total } 420 \times 3 = 1260 \text{ g}$$

$$2 \text{ kg} = 2000 \text{ g}$$

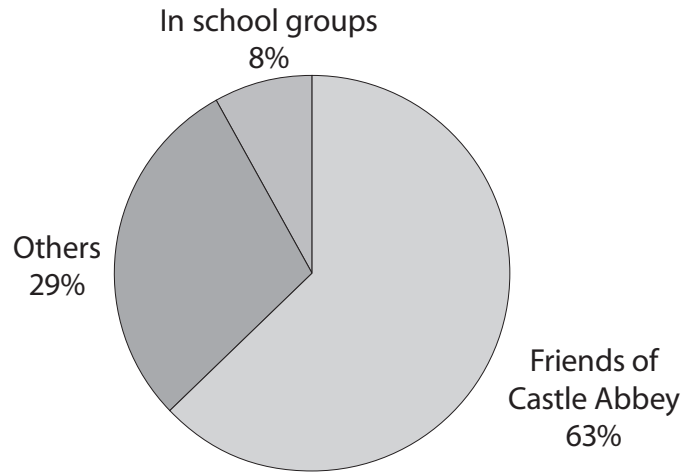
Yes it is enough as only need 1260g and has 2000g

(Total for Question 2 is 9 marks)



- 3 The manager at Castle Abbey produces a report each year. The report has a pie chart of the type of visitors for each month.

Visitors in June last year



The total number of visitors for June last year was 7275
The number of visitors in school groups in June this year was 612

Lottie says

'There are more visitors in school groups in June this year than in June last year.'

Is Lottie correct?

Show why you think this.

(2)

Use the box below to show clearly how you get your answer.



612 this
How many last
8% of 7275
 $\frac{8}{100} \times 7275 = 582$
So Lottie is correct - there are 612
this year and only 582 last year.

(Total for Question 3 is 2 marks)



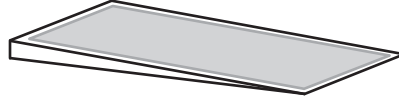
SECTION B: Theatre

Answer all questions in this section.

Write your answers in the spaces provided.

- 4 Ravi works in a local theatre.
He has a ramp for wheelchair users.

Here is the formula to find the length of a ramp.



$$L = \frac{H \times 100}{S}$$

L = length of ramp in m

H = height of step in m

S = slope in %

The height of the step is 0.3 m

A ramp for wheelchair users must have a slope of 8% or less.

The ramp in the theatre has a length of 4 m

Is this ramp suitable for wheelchair users?
Show why you think this.

(3)

$$L = \frac{H \times 100}{S}$$

$$S = \frac{H \times 100}{L} = \frac{0.3 \times 100}{4}$$

$$= 7.5\%$$

Yes it is suitable as 7.5% is less than 8%



Use the box below to show clearly how you get your answer.



A large, empty rectangular box with rounded corners, intended for the student to show their work.

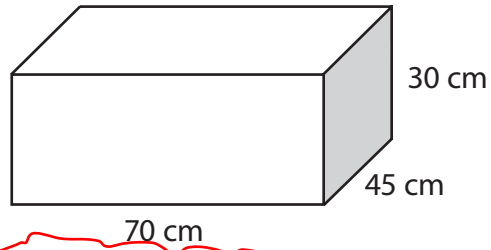
(Total for Question 4 is 3 marks)



5 Ravi builds scenery for the theatre. He needs to build a box.

The box is a cuboid with

- length 70 cm
- width 45 cm
- height 30 cm



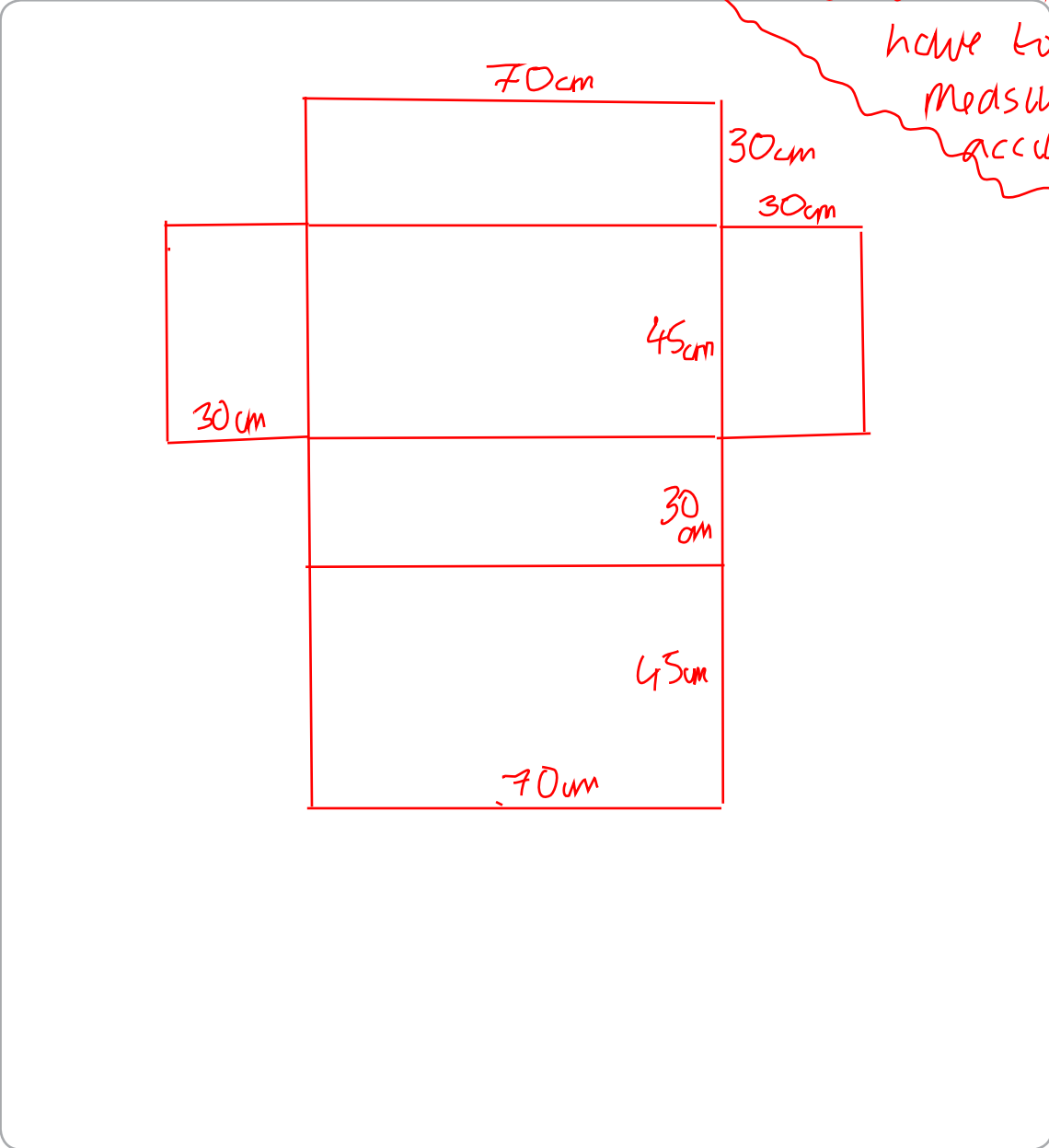
Ravi needs a sketch of a net of the box. The sketch does not need to be to scale.

A net is the shape you cut out to fold to make the box

- (a) Draw a sketch of the net of the box. Write the dimensions clearly on your sketch. (2)

Draw your sketch of the net in the space below.

A sketch doesn't have to be measured accurately



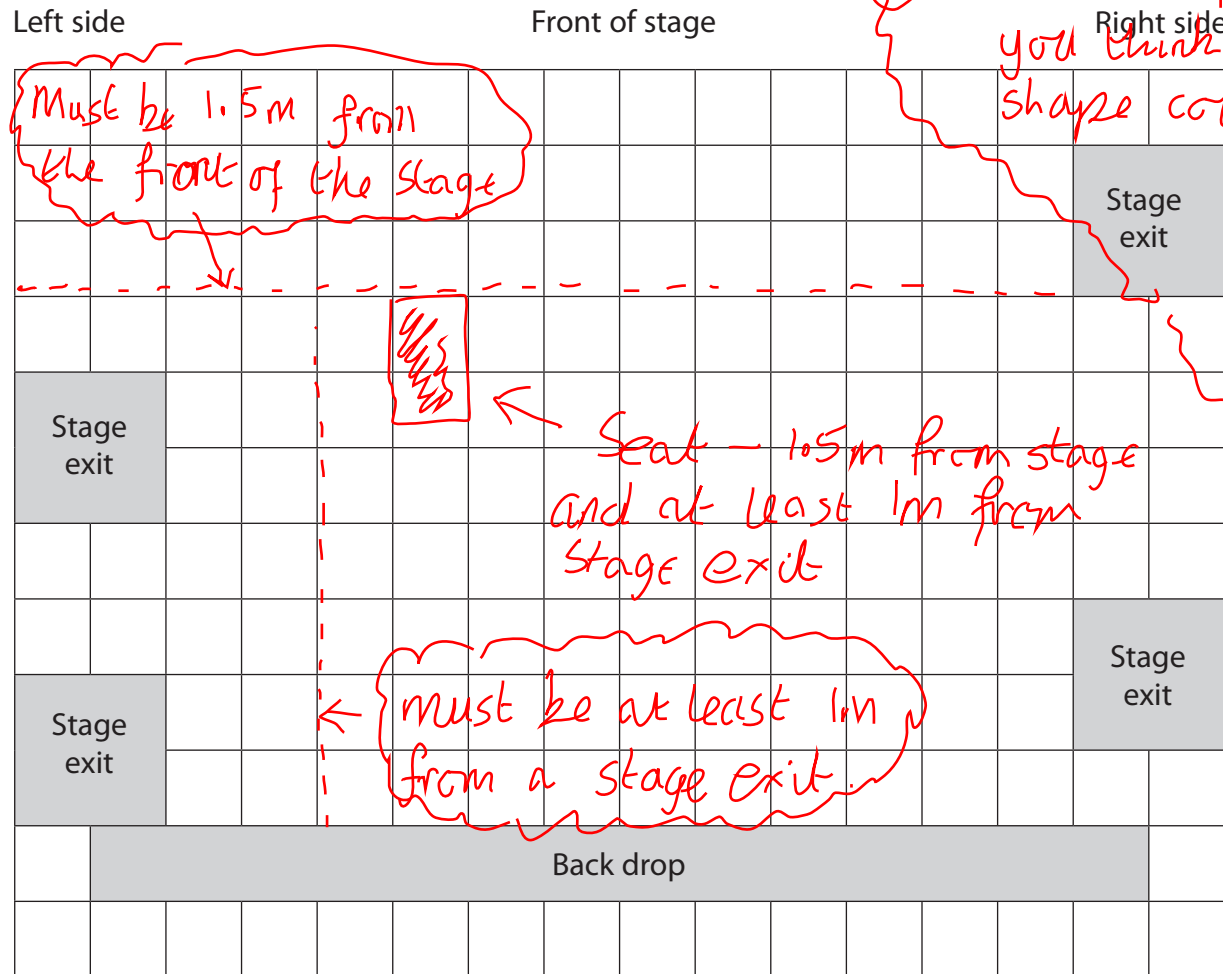
Ravi needs to place a seat on the stage.
The seat needs a rectangular space 50 cm by 75 cm.

Ravi knows that the seat must be

- at least 1 m from a stage exit
- 1.5 m from the front of the stage.

Ravi draws a plan of the stage on a grid.

(b) Draw the space for the seat on the grid.



Key: 1 cm on the grid = 0.5 m on the stage

Steps for scale drawing

- ① Look at the key
- ② Work out the size of the shapes you are going to draw
- ③ Think of any constraints - eg where it can't go
- ④ Put corners of where you think your shape could go

⑤ When happy draw lines in.

(Total for Question 5 is 5 marks)



6 Zack organises a group trip to the theatre to see a musical.

Ticket prices

Adults £12.50 each

Concessions £11.00 each

Children £9.50 each

Groups 10 + £10.50 each

The group is 2 adults, 3 concessions, and 6 children.

Zack says 'I will save £2.50 if I buy group tickets.'

(a) Is Zack correct?

Show a check of your working.

(5)

Use the box below to show clearly how you get your answer.



Plan : ① Work out cost without group tickets
② Work out cost with group tickets
③ Compare
④ Write down answer
⑤ check

① Adults $2 \times 12.50 = \pounds 25$
Concessions $3 \times 11 = \pounds 33$
Children $6 \times 9.50 = \pounds 57$ +
Total $\pounds 115$

② $2 + 3 + 6 = 11$ people going altogether
 $11 \times 10.50 = \pounds 115.50$

③ So pays $115.50 - 115 = \pounds 0.50$ more for group tickets

④ So Zack is wrong

⑤ Check $115.50 \div 10.50 = 11$



Zack drives to the theatre.

He arrives at 2.00 pm and buys a parking ticket.

Charges apply between 8 am and 6.30 pm

Up to 1 hour	1 to 3 hours	3 to 4 hours	4 hours +
70p	£1.80	£2.70	£4.50

Zack knows

- the musical starts at 2.30 pm
- it lasts for 135 minutes
- he needs 20 minutes to walk back to the car park.

(b) How much should Zack pay for parking?

(3)

Use the box below to show clearly how you get your answer.



Plan ① Work out total length of time
Zack is parked for
② Convert to hours
③ Look up fee on table

$$\begin{array}{l} \text{① } 2 - 2.30 = 30 \text{ m} \\ \text{Performance} = 135 \text{ m} \\ \text{walk} = 20 \text{ m} \\ \hline 185 \text{ m} \end{array}$$

$$\text{② } = 3 \text{ h } 5 \text{ m}$$

③ So Zack needs to pay £2.70

(Total for Question 6 is 8 marks)



SECTION C: Football

Answer all questions in this section.

Write your answers in the spaces provided.

7 Su is captain of a football team.

The team is going to play these games this season:

- 2 home games each month from September to May.
- 2 away games each month from September to May.
- 2 home games in August.

The table shows the costs for each game.

	Pitch hire	Refreshments
Home	£45 per team	£4.50 per player
Away	£50 per team	£1.50 per player

The 11 players pay at each game to cover the costs.

Su wants them to pay the same amount for home games and away games.

She needs to work out how much each player should pay at each game.

How much should each player pay at each game?

(5)

- Plan:
- ① Find out how many home games there are
 - ② Find out cost of home games
 - ③ Find out how many away games there are
 - ④ Find out cost of away games
 - ⑤ Add to find total cost
 - ⑥ Divide by total number of games to find cost per game
 - ⑦ Divide by 11 to find cost per player



Use the box below to show clearly how you get your answer.



- ① September to May is 9 months
so $9 \times 2 = 18$ games
+ 2 games in August = 20 games
- ② Cost = $20 \times 45 = 900$ pitch hire
 $11 \times 4.50 \times 20 = 990$ refreshments
Total = $900 + 990 = \pounds 1890$
- ③ September to May is 9 months
so $9 \times 2 = 18$ games
- ④ Cost is
Pitch hire $50 \times 18 = 900$
Refreshments $11 \times 18 \times 1.50 = 297$
Total = $900 + 297 = \pounds 1197$
- ⑤ Total cost = $1890 + 1197 = \pounds 3087$
- ⑥ Cost per game is $3087 \div 38$
 $= \pounds 81.24$
- ⑦ cost per player is $81.24 \div 11 = \underline{\underline{\pounds 7.39}}$

(Total for Question 7 is 5 marks)



8 Su wants to compare her team with other local teams.

Su has this information at the end of the season.

	Su's team	Pumas	Charlie's Rangers	Ashwell
Goals for	0.96	1.39	0.97	1.07
Goals against	1.30	1.89	1.59	1.79

Goals for is the average number of goals scored per game by each team.

Goals against is the average number of goals scored per game against each team.

Su wants to put this information on the team's website.

(a) Write a comment about Su's team performance to put on the website.

(1)

Write your comment in the box below.

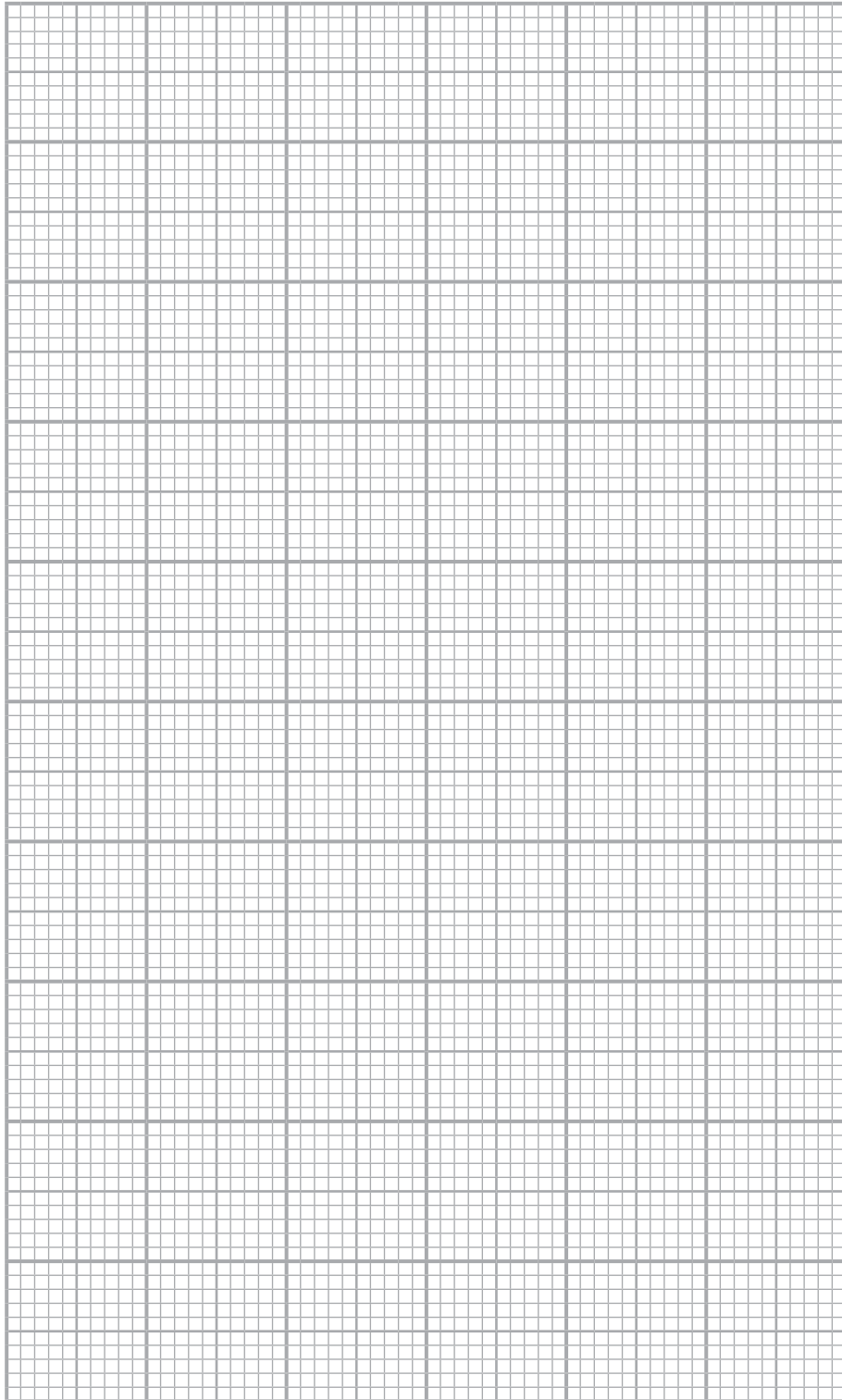
Su's team score less goals on average than the have scored against them in game 5.

Su also wants to display the information in a graph or chart.

(b) Draw a graph or chart for Su.

(3)





Su wants to compare her performance with other strikers for the website.

The table shows the number of goals scored by other strikers last season.

	Meg	Helen	Katy	Mo	Jessie	Lyn
Goals scored	11	10	8	8	20	16

Su scored 12 goals last season.

She calculates the average number of goals scored by the other strikers.

Su wants to use the average that makes her performance look better.

- (c) Does the mean or the median make Su's performance look better?
Explain your answer.

(4)

Use the box below to show clearly how you get your answer.



Plan. ① Work out the mean
② Work out the median
③ Compare to see which one makes Su's performance look better.

$$\textcircled{1} \quad \frac{11 + 10 + 8 + 8 + 20 + 16}{6} = \frac{73}{6} = 12.1\bar{6}$$

$$\textcircled{2} \quad 8 \quad 8 \quad 10 \quad 11 \quad 16 \quad 20$$

$$\text{median is } \frac{10 + 11}{2} = \frac{21}{2} = 10.5$$

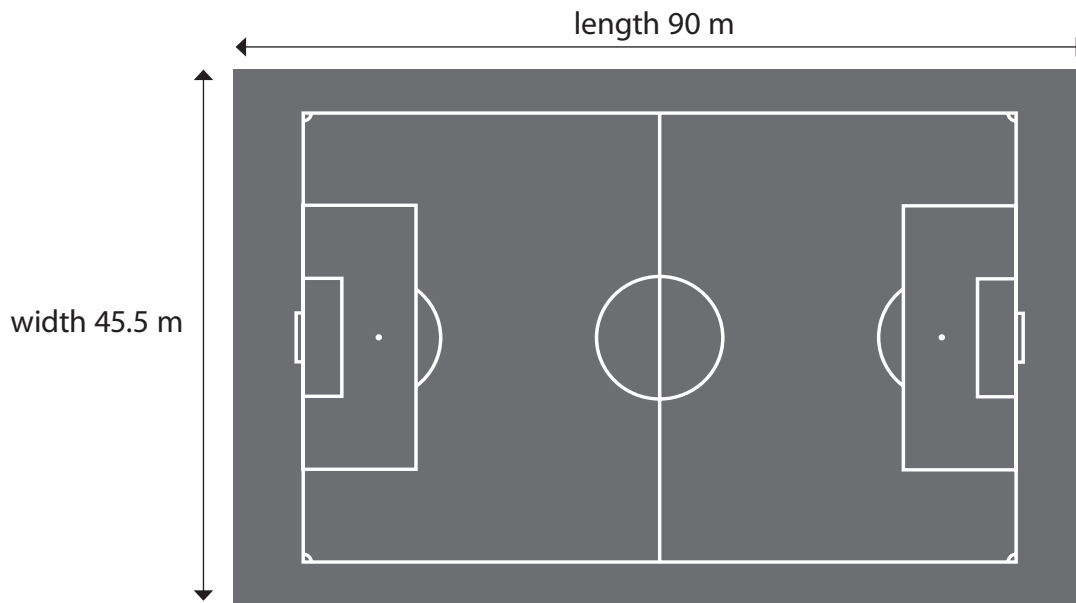
③ So the median is better as Su's 12 goals is above 10.5 and she can say she did better than average.

(Total for Question 8 is 8 marks)



9 Cale looks after the football pitch.

He needs to know the area of the pitch in hectares to put weed killer on the grass.



Cale thinks the area of this pitch is less than 5 hectares.

Use $1000 \text{ m}^2 = 1 \text{ hectare}$

Is Cale correct?
Show why you think this.

(3)

Use the box below to show clearly how you get your answer.



Plan

- ① Work out area of field in m^2
- ② Convert to hectares
- ③ Compare with 5 hectares

① Area = $45.5 \times 90 = 4095 \text{ m}^2$

② $4095 \div 1000 = 4.095 \text{ hectares}$

③ So Cale is correct the area is less than 5 hectares.

(Total for Question 9 is 3 marks)

TOTAL FOR PAPER IS 48 MARKS



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