Write your name here

Surname	Other names

Edexcel Functional Skills

Centre Number	Candidate Number

Mathematics

Level 2

10–14 January 2011
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

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.
- 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.**

Advice

- Read each question carefully before you start to answer it.
- Show all stages in the calculations.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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SECTION A: Summer fairs

Answer all questions in this section.

Write your answers in the spaces provided.

1 Kwesi organised a summer fair at Upton village.

He charged 75p per person to enter the fair.

The number of people who attended the fair was 546

Kwesi produced a summary sheet to show the income from entry to the fair and from the stalls.

Item	Details		Amount
Income from entry	546 people at	75p	
Income from stalls	Food and drink	£123.80	
	Other stalls	£172.45	
	Total income		

(a) Complete the summary sheet to show the income from entry to the fair and the stalls.

(2)

Use the box below for your calculations.

The total cost of running the fair was £75.30

(b) Work out the profit from the fair.

(1)

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

(c) Show how you can check your answer to (b).

(1)

Write your check in the box below.

(Total for Question 1 is 4 marks)

2 There is a competition for dogs at Marple village fair.
The dogs complete an obstacle course.
Lee records the time each dog takes to complete the course.

Dog competition rules

- Dogs lose 5 points each time they fail to complete an obstacle.
- Dogs get 1 point for each second their time is less than 90 seconds.
- Dogs lose 1 point for each second their time is more than 90 seconds.

Lee uses the table below to show the times and points scored by the dogs.

Points table

Dog's name	Time	Time points	Obstacle points	Total points
Rover	95 seconds	–5	–5	–10
Megan	57 seconds	33	–15	18
Jake	70 seconds		–5	
Peggy	75 seconds		–15	
Nip	98 seconds		–10	

Lee has filled in the points for some of the dogs.

The winner is the dog with the highest score.

Fill in the results table.

(5)

Results table		
Place	**Dog's name**	**Score**
1st		
2nd		
3rd		
4th		
5th		

Use the box below to show your calculations and comparisons.

(Total for Question 2 is 5 marks)

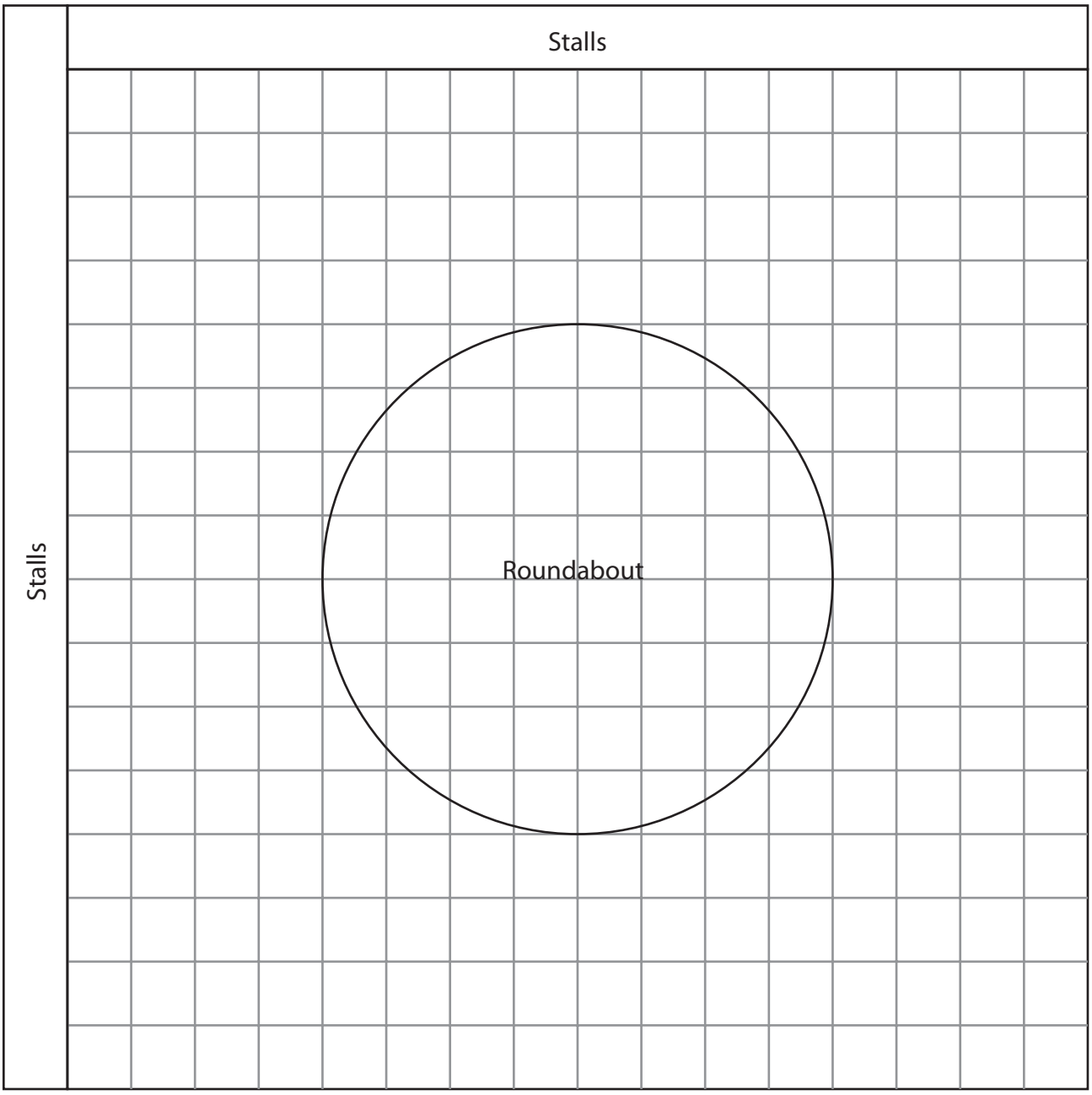
3 Johanna is planning a fair in Hallow village.
She wants to have a roundabout at the fair.

Johanna draws a plan to show the roundabout and the nearby stalls.

Johanna wants to enclose the roundabout with a fence.
She wants the fence to be in the shape of a square.
She wants a space of at least 2 m between the roundabout and the fence.
She wants a space of at least 5 m between the fence and the stalls.

(a) Show the fence on Johanna's plan.

(2)



Scale: 1 cm represents 2 m

Tape for the fence costs 69p per metre.

(b) How much will the tape cost?

(3)

Johanna wants to put a metal strip around the edge of the roundabout.
The strip will stop things rolling underneath the roundabout.

The diameter of the roundabout is 16 m.

(c) Work out the length of the strip.

(2)

You may use this formula

$C=\pi D$

C = the circumference of the roundabout
D = the diameter of the roundabout

Use the π button on your calculator or use $\pi=3.14$

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

(Total for Question 3 is 7 marks)

SECTION B: Taxis

Answer all questions in this section.

Write your answers in the spaces provided.

4 Sheila works for Ace Taxis.

Ace Taxis uses three taxis: Alpha, Beta and Charlie.

Sheila takes bookings from customers who want taxis.

Booking sheet for Tuesday						
Customer	**From**	**To**	**Pick up time**	**Drop off time**	**Journey time (in minutes)**	**Taxi**
School run	Grindley Street	Merton School	8:15	9:00	45	Alpha
School run	Marsh Bank	Merton School	8:15	9:00	45	Charlie
Miss Egan	Boston Road	Station	7:00	7:15	15	Alpha
Ms Green	Bank Street	Clinic	10:05	10:30	25	Beta
Mrs Adams	Copley Estate	Shopping Centre	9:25		20	
Miss Crispi	Shopping Centre	Green Lane Estate	10:10		25	
Mr Smith	Copley Estate	Station	7:20		25	
Mr Micel	Rose Avenue	Shopping Centre	9:40		25	

Sheila makes a booking schedule to show which taxi will be sent to each customer.

She allows 15 minutes between dropping off one customer and picking up the next.

Sheila has written four bookings on the booking schedule.

Complete the booking sheet and the booking schedule to show which taxi will be sent to each customer.

(4)

Booking schedule				
Taxis	**07:00**	**08:00**	**09:00**	**10:00**
Alpha	Miss Egan (7:00-7:15)	School run (8:15 - 9:00)		
Beta				Ms Green (10:05 -10:30)
Charlie		School run (8:15 - 9:00)		

(Total for Question 4 is 4 marks)

5 Paulo plans an advertising campaign for Ace Taxis.

He finds statistics about the people who use taxis.

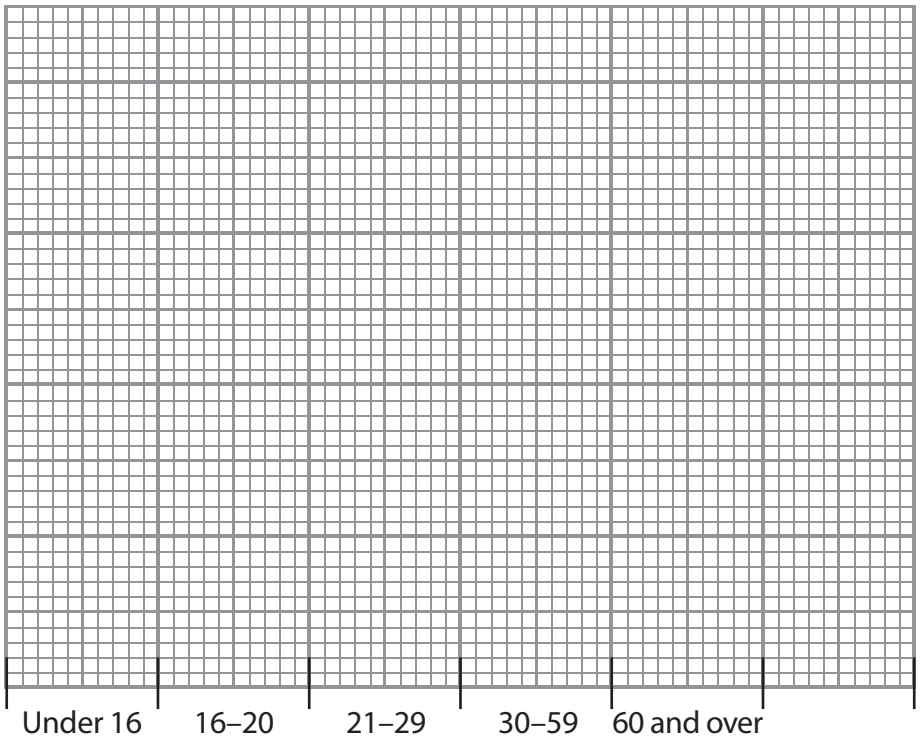
The Department of Transport published this table about taxi journeys made by males and females in different age groups.

Age	**Under 16**	**16–20**	**21–29**	**30–59**	**60 and over**
Male	7	14	19	12	8
Female	6	27	21	11	13

He wants to display this data for his manager.

(a) Draw a chart or graph that Paulo could use.

(3)



Paulo needs to write a summary for his manager.

(b) Compare the number of journeys taken by males with the number of journeys taken by females.

(2)

Use the box below to show your comparisons.

Paulo wants to aim the advertising campaign at one of the groups.

(c) Which group should Paulo choose?

(1)

Use your chart and comparisons to explain which group he should choose.
Write your answer in the box below.

(Total for Question 5 is 6 marks)

6 Sid drives a taxi for Ace Taxis.
His taxi uses fuel at the rate of 36 mpg (miles per gallon).
The taxi fuel tank holds 10 gallons of fuel.

Sid has a booking to take Sarah to the airport.
The total distance is 126 miles.
Sid starts with half a tank of fuel.

Does he have enough fuel to complete the journey?

(3)

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

(Total for Question 6 is 3 marks)

7 Rachel travelled by taxi from her home to the hospital.
The journey from her home to the hospital was 18 km.

Here is the formula for calculating a taxi fare.

$$\mathbf{F} = 320 + 30\mathbf{d}$$

F is the fare in pence
d is the distance travelled in kilometres

The taxi driver charged Rachel £10

Was she overcharged?

(3)

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

(Total for Question 7 is 3 marks)

SECTION C: Farming

Answer all questions in this section.

Write your answers in the spaces provided.

8 Neil is a farmer.

He stores bales of hay in a barn.

The barn is 14.5 m long by 14.5 m wide.

Each bale of hay is 0.9 m long by 0.45 m wide by 0.45 m high.

He places some bales of hay lengthwise on the ground along the back wall of the barn.

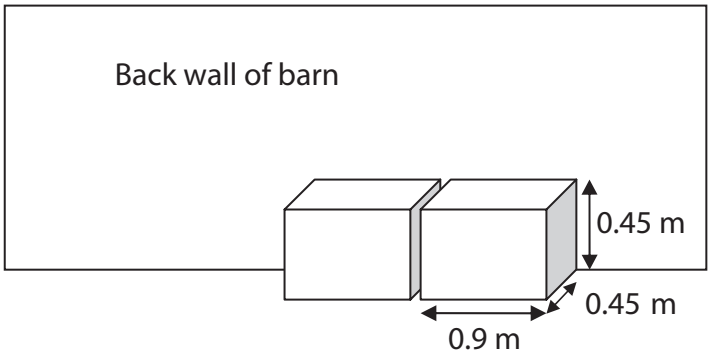


Diagram **NOT** accurately drawn

(a) How many bales of hay can Neil place along the back wall?

(2)

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

Neil stores 4000 bales of hay in the barn.
He stacks the bales of hay in rows, with no spaces between the bales.
Each row is 10 bales high.
He leaves a rectangular space on the ground at the front of the barn.

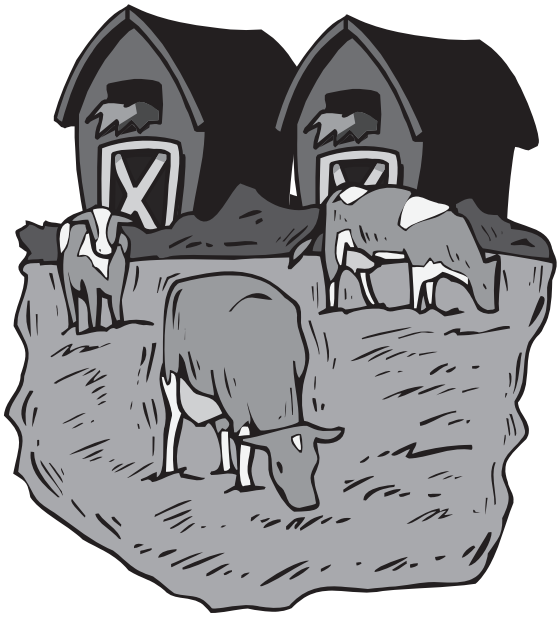
(b) Work out the size of the space on the ground at the front of the barn.

(4)

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

(Total for Question 8 is 6 marks)

9



Neil has a herd of 120 cows.

The cost of keeping a cow is an average of £60 per month.

Last year the cows produced a total of 600 000 litres of milk.

Neil sold the milk to a dairy for 22p per litre.

At the end of the year Neil needs to know how much profit he has made from the herd.

(a) Work out the amount of profit.

(5)

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

Neil's herd has 120 **mature** cows.

Last year the herd produced a total of 600 000 litres of milk.

Neil is thinking of buying some **young** cows to increase the size of his herd.

On average, young cows produce 10% less milk than mature cows.

Neil wants to estimate how much milk the young cows will produce.

(b) Calculate an estimate for the amount of milk one **young** cow will produce in one year.

(3)

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

(Total for Question 9 is 8 marks)

10 Neil wants to buy a trailer. It is 20 ft long.
Neil's shed is 7.5 m long.

1 ft = 0.3 m

Will the trailer fit in the shed?

(2)

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

(Total for Question 10 is 2 marks)

TOTAL FOR PAPER IS 48 MARKS

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