

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



19–23 March 2012

**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.**



## 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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**PEARSON**

## SECTION A: A music evening

Answer all questions in this section.

Write your answers in the spaces provided.

- 1 Mo is planning a music evening in the college hall.  
Students will sing the songs they like for their family and friends.

The evening will start at 8 pm.

The music evening must finish and everything be put away before midnight.

Mo knows that

- there will be 40 songs
- each song will last an average of 2 minutes 30 seconds
- a total time of 40 minutes will be needed to change between singers
- there will be a 30 minute break
- it will take 45 minutes to put everything away at the end of the evening.

(a) Will the evening finish and everything be put away before midnight?  
Show why you think this.

(4)

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



A large empty rectangular box for writing the answer to question (a).



Mo needs some posters and flyers to advertise the music evening.

Here are the prices.

**Large posters**

£3.50 each

£19 for 50

**Flyers**

£16 for 100

£25 for 250

Mo needs 5 large posters and 200 flyers.

(b) What is the cheapest total cost for 5 large posters and 200 flyers? (3)

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



Large empty box for showing the solution.

(Total for Question 1 is 7 marks)



- 2 The singers will need 20 backing tracks.  
Mo finds out that for a good music evening

$\frac{3}{5}$  of the backing tracks should be instrumental with vocals  
the rest of the backing tracks should be instrumental only.

(a) Complete the table to show how many of each track are needed.

(2)

Use the box below for your answer.



Type of backing track	Instrumental with vocals	Instrumental only
Number		

Mo wants to buy the 20 backing tracks online.

Here are the prices from three online stores.

**Unlimited tracks**

Instrumental with vocals: £1.05 each

Instrumental only: £1 each

**Sing along**

All tracks the same price: £1.10 each

buy 10 for the price of 9

**Budget tracks**

Tracks: £1.17 each

buy 20 or more get 15% off total cost



Mo wants to buy all the tracks from one store.

(b) Which store is cheapest for Mo? (6)

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





A large, empty rectangular box with rounded corners, intended for writing an answer.

**(Total for Question 2 is 8 marks)**



**3** Mo writes down the money spent and the money received for the music evening.

The table shows the money spent, the money received and the balance up to 19 June.

		<b>Money spent (£)</b>	<b>Money received (£)</b>	<b>Balance (£)</b>
11 June	Singers' tickets		144.00	144.00
13 June	Hire of hall	40.00		104.00
17 June	Equipment hire	204.74		-100.74
19 June	Ticket sales		75.00	

Complete the balance column for Mo.

(1)

You can use the box below for your working.

(Total for Question 3 is 1 mark)



## SECTION B: Green energy

Answer all questions in this section.

Write your answers in the spaces provided.

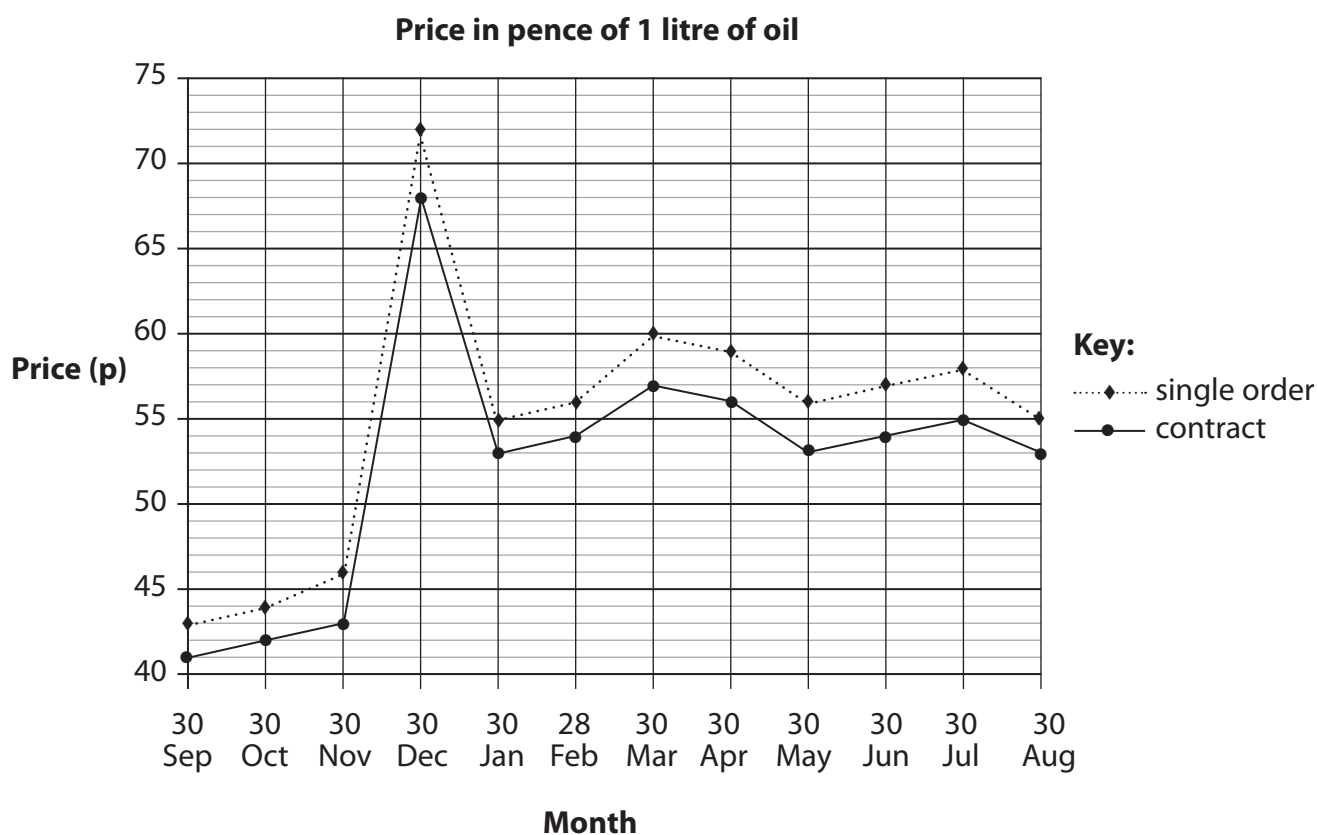
4 Yusef has oil central heating in his house.

On 30 January Yusef bought 600 litres of oil.

On 30 June Yusef bought 1000 litres of oil.

Yusef paid 'single order' prices for the oil.

The graph shows the 'single order' and 'contract' price of oil over 12 months.



Yusef looks at the graph for 30 January and 30 June.

He thinks that the total 'contract' cost for his orders on those dates was £50 less than the total 'single order' cost.

Is Yusef right?  
Show why you think this.

(5)





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



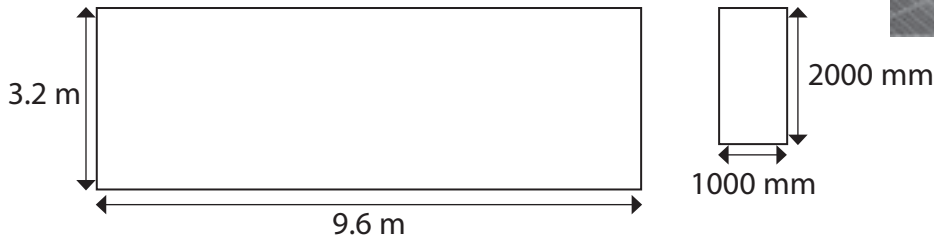
A large, empty rectangular box intended for the student to show their work.

**(Total for Question 4 is 5 marks)**



5 Yusef plans to put solar panels on the roof of his house to produce some electricity.

The diagrams show one side of the roof and a solar panel.



Diagrams **NOT** accurately drawn

Yusef knows:

- each solar panel on the roof needs a space of 1000 mm by 2000 mm
- the panels must all be the same way round
- the side of the roof is 9.6 m by 3.2 m
- he wants as many solar panels as possible.

(a) How many solar panels could Yusef fit on one side of the roof?

(4)

Use the boxes below and on the next page to show clearly how you get your answer.





Yusef knows the solar panels will not produce all the electricity he needs.

The solar panels can produce 2800 kWh of electricity in a year.

The table shows how much electricity Yusef used each year for the last 6 years.

Year	2006	2007	2008	2009	2010	2011
Electricity used (kWh)	4000	3800	3600	4200	4500	3900

Yusef thinks he uses a mean average of 4000 kWh of electricity each year.

(b) Work out if Yusef is right.

(2)

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



The government pays people 43.3p for each kWh of electricity produced by their solar panels.

The solar panels can produce 2800 kWh of electricity in a year.

Yusef wants to know how much the government will pay for the electricity.

(c) Work out, to the nearest pound, how much the government will pay Yusef for 2800 kWh of electricity.

Show a check of your calculation.

(3)

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 calculation and check.

**Total for Question 5 is 9 marks)**

6 Yusef knows he can get a cheap deal on solar panels if some of his neighbours also buy solar panels.

He asks 10 of his neighbours the type of heating they have.  
He also asks them to decide if they would like to have solar panels.



Here is Yusef's data collection sheet.

Name	Oil heating	Electric heating	Would like solar panels?
Fred	✓		Yes
Pete		✓	No
Hussein		✓	Yes
Uzma	✓		Yes
Katy	✓		No
Dwayne	✓		No
Rina		✓	No
Charles	✓		Yes
Nazanin		✓	No
Tara	✓		Yes

Yusef wants to put the results in a two-way table.  
The table must separate the data by the type of heating and the decision about solar panels.

Make a two-way table and complete it for Yusef. (2)

Use the box below to show your two-way table.

(Total for Question 6 is 2 marks)



### SECTION C: Bouncy castles and ball pits

Answer all questions in this section.

Write your answers in the spaces provided.

- 7 Lucy's company hires out bouncy castles for parties. She needs to buy 4 new bouncy castles.



Lucy finds out the costs from the USA:

- bouncy castles cost \$499 each
- delivery of 4 bouncy castles costs \$180

Lucy has a budget of £1300 for the cost of the bouncy castles and the delivery.

Use \$1 = £0.62

Can Lucy afford to pay for the 4 bouncy castles and the delivery cost?

(3)

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



(Total for Question 7 is 3 marks)



8 Lucy also buys ball pits from the USA.  
They cost £135

Import tax of 9% is added to the cost of the ball pits.

Lucy has to pay VAT.

VAT is 20% of the **total** of the cost of the ball pits  
and the import tax.



Lucy's VAT bill is £29.43

Is Lucy's VAT bill correct?

(4)

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



A large, empty rectangular box for writing the answer.

(Total for Question 8 is 4 marks)



9 Lucy needs new play balls for a ball pit.

She knows she needs enough balls for a total volume of  $300\,000\text{ cm}^3$ .

Lucy uses this method to work out the approximate number of balls she needs:

- i) work out the volume of one ball
- ii) divide the total volume by the volume of one ball
- iii) multiply by 0.85

Lucy uses this formula to work out the volume of one ball.

$$V = 0.52 \times d^3$$

V is the volume of the ball  
d is the diameter of the ball

The diameter of each play ball is 8 cm.

Lucy buys 1000 play balls.

(a) Does Lucy have enough?

(5)





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



The play balls are different colours.  
Lucy's favourite colour is red.

The table shows the number of balls of each colour in a pack.

Colour	Yellow	Red	Green	Blue
Number of balls	30	80	40	50

Lucy takes one of the balls at random.

(b) What is the probability that Lucy takes a red ball?

(2)

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



Lucy uses an electric pump to inflate the ball pits.

The pump delivers  $27\,000\text{ cm}^3$  of air per minute.

One of the ball pits needs  $720\,000\text{ cm}^3$  of air.

Lucy has 30 minutes to inflate this ball pit before a party.

(c) Will the pump inflate this ball pit in less than 30 minutes?

(2)

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



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**(Total for Question 9 is 9 marks)**

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**TOTAL FOR PAPER IS 48 MARKS**



**Acknowledgements**

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Bouncy castle image – ‘Pro disco services’

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