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Level 2

Information for centres and learners

- The duration of this examination is **1 HOUR 50 MINUTES**. The examination consists of **16 QUESTIONS** and is worth **53 MARKS**.

We listen and respond

1

Calculate 13% of £255

Write the answer in the box below.

(1 mark)

$$0.13 \times £255 =$$

Answer: £ 33.15

2

A company asked its 230 employees if they would like more flexible working hours. Of those asked, 198 said yes.

What percentage of the employees said yes?

Show your working and write your answer in the box below.

(2 marks)

$$\frac{198}{230} \times 100 = 86.09\%$$

Answer: 86.09 %

3

Show how you could check your answer to question 2.

Show your working out in the box below.

(1 mark)

$$\frac{86.09}{100} \times 230 = 198.007 = 198$$

4

A taxi company uses the following formula to calculate the cost of each journey in pounds (£):

$$C = 0.5n + 5$$

C = cost (£)

n = number of miles travelled

Calculate the cost of a journey that is 25 miles.

Show your working out and write the answer in the box below.

(2 marks)

$$(0.5 \times 25) + 5 = 12.5 + 5 = £17.50$$

Answer: 17.50

5

Convert 5000 grams (g) in to pounds (lb).

$$1\text{ kg} = 2.2\text{ lb}$$

Show your working out and write the answer in the box below.

(2 marks)

$$5000\text{ g} = 5\text{ kg}.$$

$$1\text{ kg} = 2.2\text{ lb}$$

$$\text{so } 5000\text{ g} = 5 \times 2.2 = 11\text{ lb}$$

Answer: 11 lb

6

Show how you could check your answer to question 5.

Show your working out in the box below.

(1 mark)

$$\frac{11}{2.2} = 5\text{ kg}, \quad 5 \times 1000 = 5000\text{ g}.$$

7

Calculate the value of x where:

$$x = 15 + 84^2 \div 3$$

Write the answer in the box below.

(1 mark)

$$\frac{84^2}{3} = 2352$$

$$15 + 2352 = 2367$$

Answer: 2367.

8

Calculate $2\frac{5}{8} + 1\frac{1}{16}$

Give your answer as a mixed number.

Show your working out and write the answer in the box below.

(2 marks)

$$2\frac{5}{8} = \frac{16}{8} + \frac{5}{8} = \frac{21}{8} = \frac{42}{16}$$

$$\frac{42}{16} + \frac{1}{16} = \frac{53}{16} = \frac{48 + 5}{16} = 3\frac{5}{16}$$

Answer: ~~3~~ 3 $\frac{5}{16}$.

9

What is 36 out of 96 as a fraction? Simplify your answer.

Show your working out and write the answer in the box below.

(2 marks)

$$\frac{36}{96} \div \frac{6}{6} = \frac{6}{16} .$$

$$\frac{6}{16} \div \frac{2}{2} = \frac{3}{8} .$$

Answer: 3/8 .

Scenario A

You work for Highfield Builders.

10

This table shows the number of different sized pipes that have been used at Highfield Builders in January. The pipes are **grouped** according to the size of their diameter.

January: Number of Pipes Used (by Grouped Size)					
Diameter (cm)	35-39	40-44	45-49	50-54	55-59
Frequency	8	10	13	3	1

The manager thinks that the mean diameter of pipe used must be in the 45-49 cm group as this is the group most used.

Is the manager correct?

Show your working out and write the answer in the box below.

(5 marks)

Midpoint	37	42	47	52	57
Freq.	8	10	13	3	1
Mid x Freq.	296	420	611	156	57

$$\Rightarrow \text{Total length} \approx 296 + 420 + 611 + 156 + 57 = 1540$$

$$\text{Total number of pipes} = 8 + 10 + 13 + 3 + 1 = 35$$

$$\frac{1540}{35} = 44.$$

Answer: No, mean is in 40-44 cm

11

You are working out how much it will cost to pay a team of builders to complete a new project.

You know that:

- 6 builders will work on the project
- each builder normally works 8 hours per day
- each builder is paid £12 per hour
- the project will take 42 working days to complete

You agree to pay the 6 builders extra money (overtime) to complete the project sooner, in 35 working days. Overtime is paid at the rate of £18 per hour for each hour worked after the first 8 hours per day.

How much more will it cost to pay the builders to complete the work in 35 working days rather than 42 working days?

Show your working out and write the answer in the box below.

(6 marks)

$$6 \times 8 \times £12 = £576 \text{ per day.}$$

$$£576 \times 42 = £24192 \text{ for full project (42 days).}$$

(This is 2016 hours of work).

$$35 \times 8 \times 6 = 1680 \text{ regular hours.}$$

$$2016 - 1680 = 336 \text{ overtime hours.}$$

$$1680 \times £12 = £20160 \text{ (regular time).}$$

$$336 \times £18 = £6048 \text{ (overtime)}$$

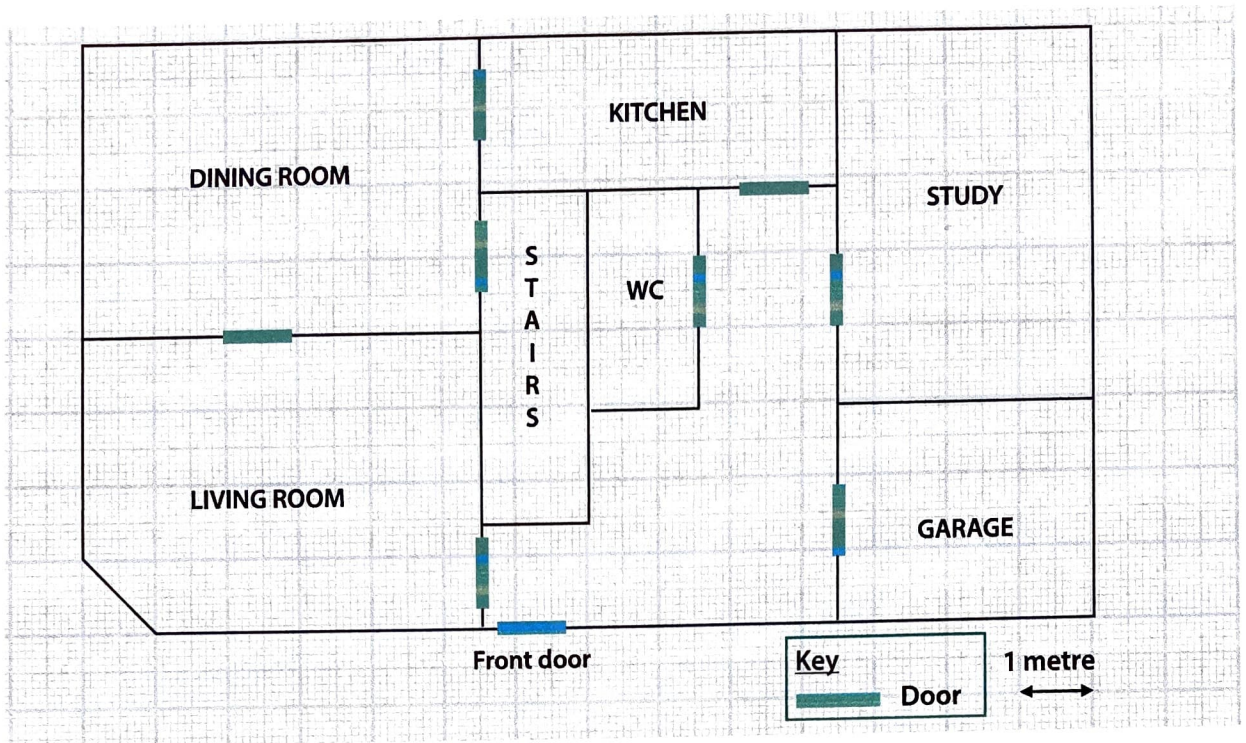
$$£20160 + £6048 = £26208 \text{ (35 days).}$$

$$£26208 - £24192 = £2016 \text{ extra.}$$

Answer: £ 2016.

12

A customer has asked you to install a new heater in their living room. You have this floor plan:



You need to work out the volume of the **living room** so that you can advise the customer which size of heater you need to install. There are 3 heaters to choose from:

	Elite	Deluxe	Supreme
Suitable for rooms of capacity:	1765-2400ft ³	1050-1750ft ³	880-1590ft ³

The height of the living room is 2.2m

$$35.3\text{ft}^3 = 1\text{m}^3$$

Which heater would you recommend for the customer's living room?

Show your working out and write the answer in the box below.

(5 marks)

$$\text{Living room (square)}: 5.5\text{m} \times 4\text{m} \times 2.2\text{m} = 48.4\text{m}^3$$

$$\text{Living room (missing triangle)}: \frac{1}{2}(1\text{m} \times 1\text{m} \times 2.2\text{m}) = 1.1\text{m}^3$$

$$\text{Living room: } 48.4 - 1.1 = 47.3\text{m}^3.$$

$$47.3 \times 35.3 = 1669.69\text{ft}^3.$$

$\Rightarrow$ Deluxe

Answer: Deluxe.

13

Highfield Builders is planning to build some new apartments in Highfield Town. The apartments will be ready to sell in 2025.

Your manager has asked you to research the selling prices of apartments in Highfield Town and you find this information:

Selling prices in the year 2005 (£)	Selling prices in the year 2015 (£)
54,050	132,000
72,000	105,500
68,000	98,500
49,000	143,000
56,500	110,250
49,900	172,600
73,250	
63,500	

What will be the mean selling price of an apartment in 2025 if the mean price rises by the same percentage as it did between 2005 and 2015?

Show your working out and write the answer in the box below.

(6 marks)

$$\text{Mean of 2005: } \frac{54050 + 72000 + \dots + 73250 + 63500}{8} = £60775.$$

$$\text{Mean of 2015: } \frac{132000 + 105500 + \dots + 110250 + 172600}{6} = £126975$$

$$\frac{126975 - 60775}{60775} \times 100 = 108.9\% \text{ increase.}$$

$$£126975 \times 2.089 = £265284.26 \Rightarrow £265300$$

Answer: £ 265300.

Please continue to answer questions 14 - 16

Scenario B

You volunteer to help at your local nursery.

14

You are helping to create a new play area at the nursery.

The play area needs to be a rectangle that has an area of 54m^2

You need to have the following equipment in the play area and you know that:

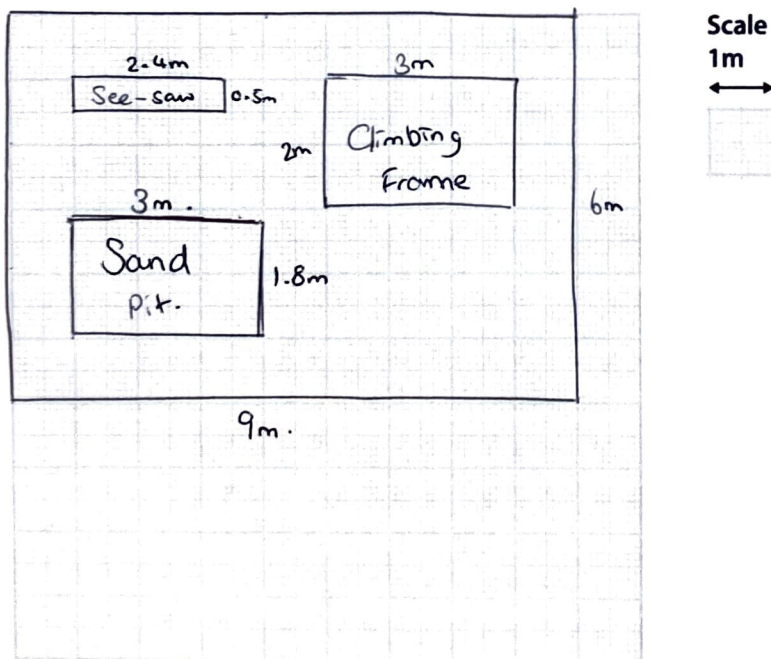
- the see-saw measures $2.4\text{m} \times 0.5\text{m}$
- the climbing frame measures $2\text{m} \times 3\text{m}$
- the sand pit measures $1.8\text{m} \times 3\text{m}$
- each piece of equipment needs at least 1m clearance from the edge of the playing space and other pieces of equipment

- Draw the outline of the play area on the grid below.
- Draw and label the play equipment on the play area.

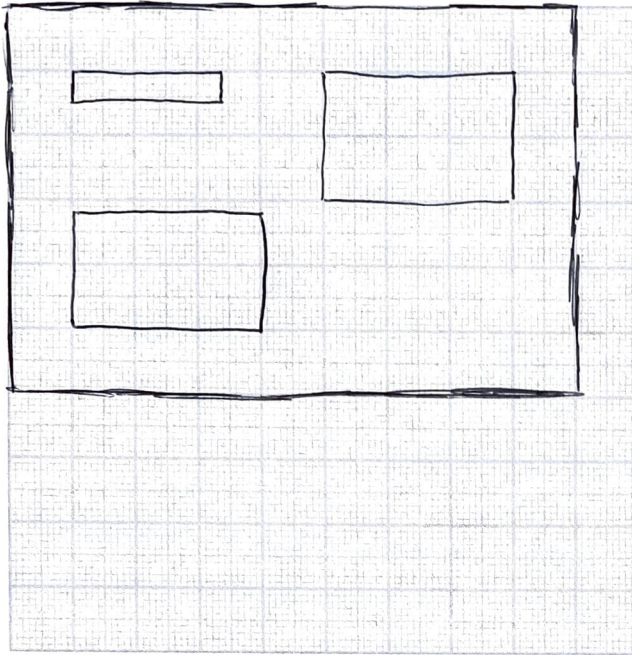
There is a planning grid and a box for working on the next page.

Draw your final answer on the grid below.

(6 marks)



You may use this grid to plan the play area. PLANS WILL NOT BE MARKED.



Scale
1m



Show your working out in the box below.

$$54m^2 = 9m \times 6m$$

15

You have been asked to order the sandpit for the play area.

A supplier has 3 suitable sandpits for sale.

Sandpit	Price of Sandpit (£)	Total Weight (kg)
Blue	25	28
Green (including free cover)	26	30
Red (including free cover)	30	32

The supplier uses this formula to calculate how much they would charge for delivering and setting up the sandpit:

$$C = 1.2 (0.45m + 0.8w)$$

Where:

C = charge to the customer in £

m = total number of miles

w = the total weight of the item in kg

The distance to be travelled is 25 miles.

The nursery's total budget for the sandpit (including delivery and setting up) is £70.

Which sandpit would you choose?

Show your working out and write the answer in the box on the opposite page.

(5 marks)

Set $m = 25$.

Blue: $(1.2 \times ((0.45 \times 25) + (0.8 \times 28))) + 25 = £65.38 \text{ total.}$

Green: $(1.2 \times ((0.45 \times 25) + (0.8 \times 30))) + 26 = £68.30 \text{ total}$

Red: $(1.2 \times ((0.45 \times 25) + (0.8 \times 32))) + 30 = £74.22 \text{ total.}$

(0.45×25) cost of delivery and set up.	(0.8×32) cost of sandpit.	$£74.22$ total cost.
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They can afford the Blue or Green.

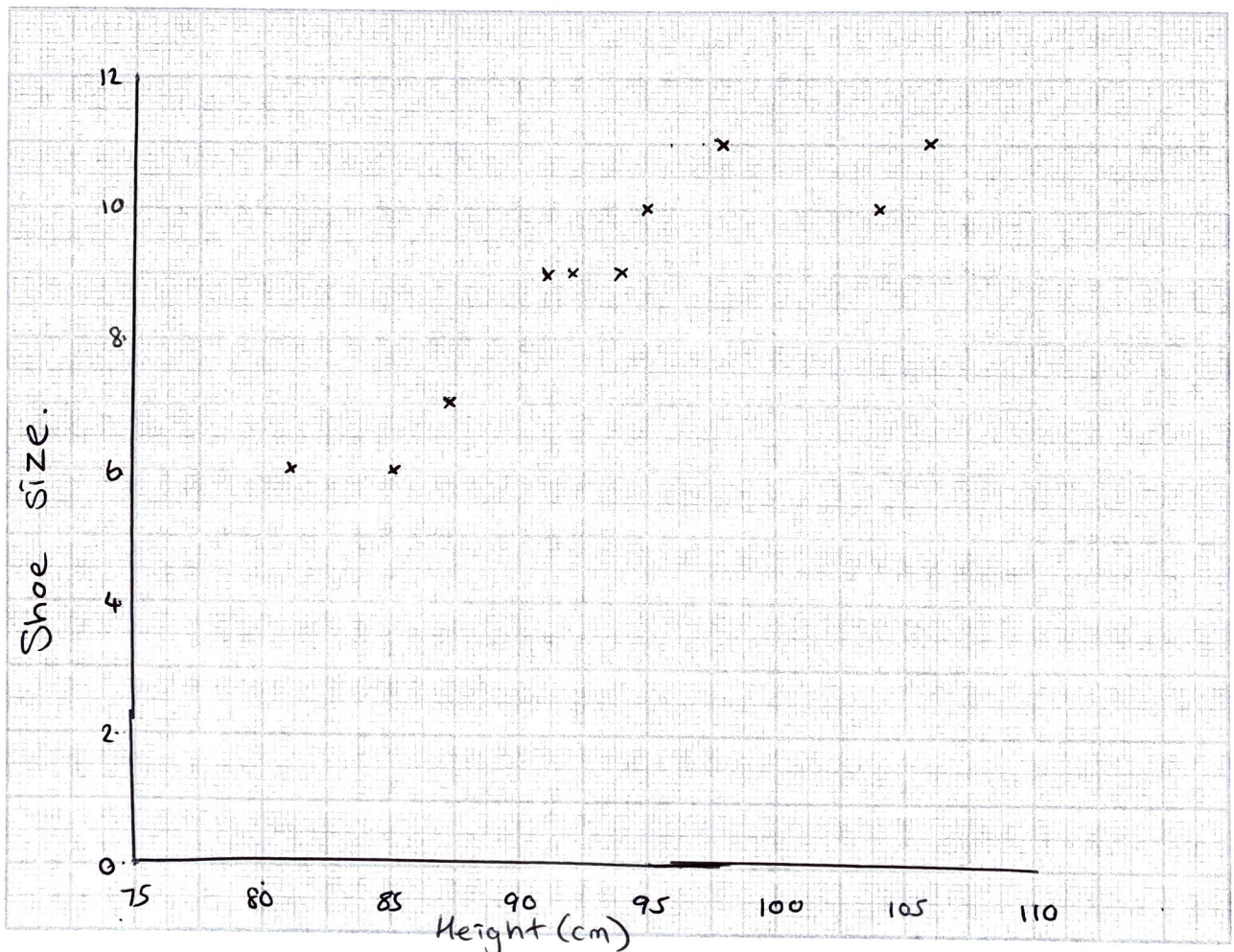
Answer: Green.

This is a table of the heights and shoe sizes of some of the children at the nursery.

Name	Height (cm)	Shoe Size
Ben	98	11
Rosie	104	10
Holly	94	9
Eva	106	11
Samira	81	6
Tom	85	6
Meeku	92	9
Cameron	95	10
Rakeeb	91	9
Joseph	89	7

a. Draw a scatter diagram to represent this data.

(4 marks)



b. What type of correlation does this graph show?

Write your answer in the box below.

(1 mark)

Answer:

Positive correlation

c. What is the mode shoe size of the children?

Write your answer in the box below.

(1 mark)

Answer: 9.

END OF ASSESSMENT