

# GCSE Mathematics Practice Tests: Set 1

## Paper 1F (Non-calculator)

Time: 1 hour 30 minutes

You should have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.

### 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 must not be used.**
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must **show all your working out.**



### Information

- The total mark for this paper is 80
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*

### Advice

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

### Practice Tests: Set 1 Regular (1F) – Version 1.0

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Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1. Write these numbers in order of size.  
Start with the smallest number.

6      -3      9      -5      4

Ordering Integers

$-5, -3, 4, 6, 9$

(Total 1 mark)

2. Change 430 centimetres into metres.

$$100\text{cm} = 1\text{m}$$

$$\begin{array}{r} \rightarrow \\ \div 100 \end{array}$$

$$430\text{cm} = 4.3\text{m}$$

$$\begin{array}{r} \rightarrow \\ \div 100 \end{array}$$

Converting Metric Units

$4.3$  metres

(Total 1 mark)

3. Change 0.3 into a fraction.

U.t

$$0.3 = 3 \text{ tenths} = \frac{3}{10}$$

Converting FDP

$\frac{3}{10}$

(Total 1 mark)

4. Change 0.7 into a percentage.

U.t

$$0.7 = 7 \text{ tenths} = \frac{7}{10} = \frac{70}{100}$$

$\times 10$

$\rightarrow$

$$\frac{7}{10} = \frac{70}{100}$$

$\rightarrow$

$\times 10$

Converting FDP

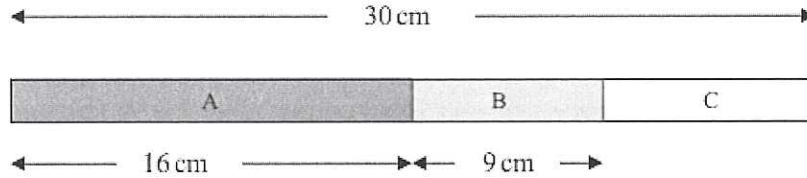
$70$  %

(Total 1 mark)

# Integer Subtraction

5.

Diagram NOT accurately drawn



Here is a picture of a stick.  
The stick is in three parts, A, B and C.

The total length of the stick is 30 cm.  
The length of part A is 16 cm.  
The length of part B is 9 cm.

Work out the length of part C.

$$\begin{array}{l|l}
 \text{Total} = 30\text{cm} & 30\text{cm} = 16\text{cm} + 9\text{cm} + C \\
 & 30\text{cm} = 25\text{cm} + C \\
 (-25) & 5\text{cm} = C
 \end{array}$$

..... 5 cm  
(Total 2 marks)

6. Jessica thinks of a number.

$$= x$$

She multiplies the number by 3.  $3x$   
She then subtracts 7.  $3x - 7$   
Her answer is 5.

Forming Equations

What number did Jessica think of?

$$\begin{array}{l|l}
 & 3x - 7 = 5 \\
 (+7) & 3x = 12 \\
 (\div 3) & \underline{\underline{x = 4}}
 \end{array}$$

.....  $x = 4$  .....  
(Total 2 marks)

## Unitary Method

7. The total cost of these 2 pens is 60p.



Work out the total cost of 5 of these pens.

Give your answer in pounds.

$$\begin{array}{l|l} 2 \text{ pens} & 2 \text{ pens} = 60 \text{ p} \\ (\div 2) & 1 \text{ pen} = 30 \text{ p} \\ (x 5) & 5 \text{ pens} = \underline{\underline{\pounds 1.50}} \end{array}$$

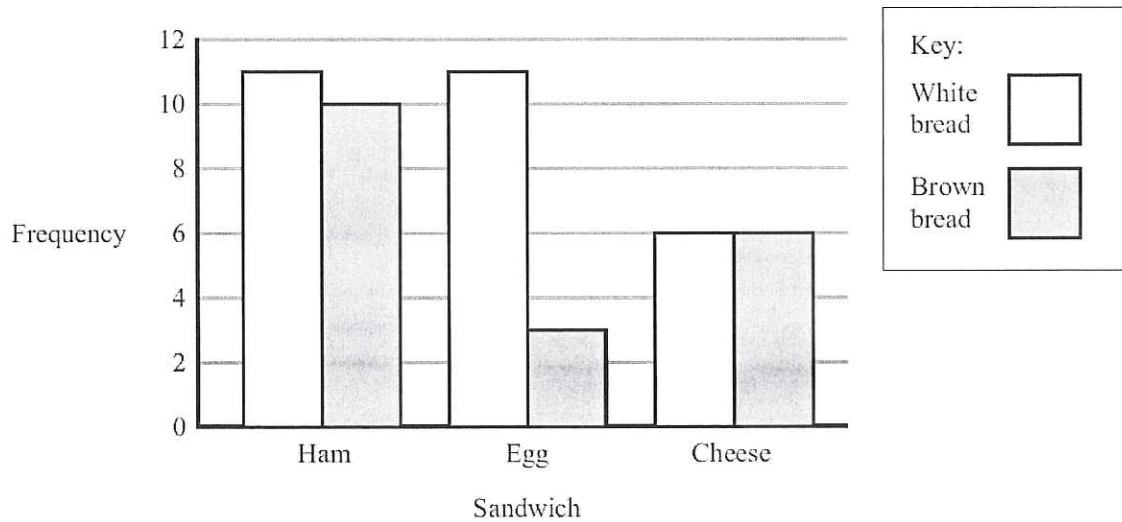
£ 1.50 .....

(Total 3 marks)

## Interpreting Bar Charts

8. Ann works in a sandwich shop.

The dual bar chart shows information about the sandwiches sold.



- (a) Write down the total number of cheese sandwiches sold.

$$\text{Cheese} = 6 + 6 = \underline{\underline{12}}$$

..... 12  
(1)

More white bread sandwiches were sold than brown bread sandwiches.

- (b) Work out how many more white bread sandwiches.

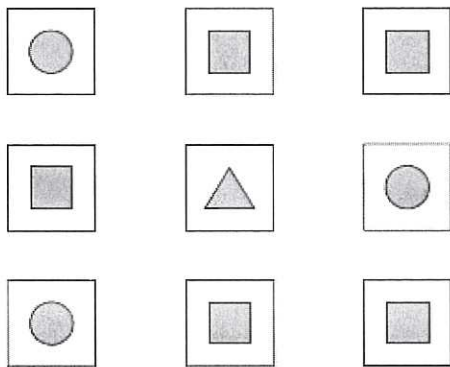
$$\begin{array}{l|l} \text{white bread:} & 11 + 11 + 6 = 28 \\ \text{brown bread:} & 10 + 3 + 6 = 19 \\ \text{Difference:} & 28 - 19 = \underline{\underline{9}} \end{array}$$

..... 9  
(2)

(Total 3 marks)

# Simple Probability

9. James has 9 cards.  
Each card has a shape drawn on it.  
Each shape is a circle or a square or a triangle.



James takes a card at random.

- (i) Which shape is **most** likely to be on the card?

..... *square* .....

- (ii) What is the probability that James takes a card that has a square on it?

*"5 out of 9" =  $\frac{5}{9}$*

.....  $\frac{5}{9}$  .....

(Total 3 marks)

10. David is going to buy a cooker.  
The cooker has a price of £320.  
David pays a deposit of 15% of the price of the cooker.

*% of an Amount / Percentage Increase*

How much money does David pay as a deposit?

	$£320 = 100\%$	
$(\div 10)$	$£32 = 10\%$	
$(\div 2)$	$£16 = 5\%$	
$10\% + 5\%$	$£32 + £16 = 15\%$	
	<u><math>£48 = 15\%</math></u>	

$2 \sqrt{32} = 16$

£..... *48* .....

(Total 2 marks)

# Solving Linear Equations

11. (a) Solve  $x + 3 = 12$

$$(-3) \mid x = 9$$

$$x = \overset{9}{\dots\dots\dots} \quad (1)$$

(b) Solve  $\frac{y}{5} = 10$

$$(x5) \mid y = 50$$

$$y = \overset{50}{\dots\dots\dots} \quad (1)$$

(Total 2 marks)

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## Combinations

12. Here is a menu in a café.

Menu	
Starter	Main Course
Soup	Chicken
Melon	Fish
	Omelette

A meal is a starter and a main course.  
One possible meal is Soup and Chicken, (S, C).

Charlie wants to choose a meal.

- (a) Make a list of all the different meals she can have.  
One has been done for you.

(S, C) (S, F), (S, O), (M, C), (M, F), (M, O) .....

.....

(2)

A meal is chosen at random.

- (b) What is the probability that the meal will be Melon and Chicken?

"1 out of 6"

$\frac{1}{6}$

.....

(1)

The café adds fruit juice as another starter.

Charlie says 'Now there will be one more meal to choose from'.

- (c) Show that Charlie is wrong.

Because the new options are (J, C), (J, F) and  
.....  
(J, O). This is 3 new meals.  
.....

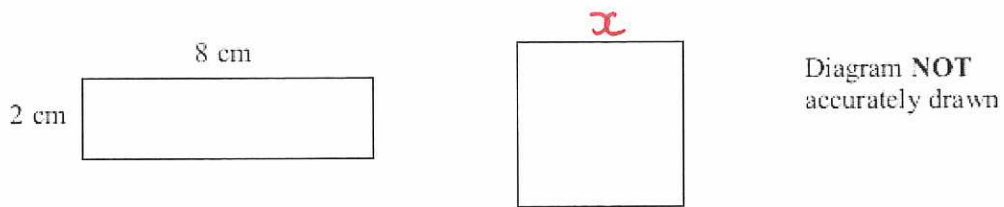
(1)

(Total 4 marks)



# Forming and Solving Equations

13. The diagram shows a rectangle and a square.



The perimeter of the rectangle is the same as the perimeter of the square.

Work out the length of one side of the square.

$$\begin{array}{l} \text{Perimeter} = \text{Perimeter} \\ \text{(Rectangle)} \quad \text{(Square)} \\ \\ \text{collect} \\ \\ (\div 4) \end{array}$$

$$2\text{cm} + 8\text{cm} + 2\text{cm} + 8\text{cm} = x + x + x + x$$

$$20\text{cm} = 4x$$

$$\underline{\underline{5\text{cm}}} = x$$

..... 5 cm

(Total 4 marks)

## Measurements of Time

14. (a) Write 8 45 p.m. as a 24-hour clock time.

20:45

(1)

Seeta did a puzzle in 3 minutes 45 seconds.  
Ninal did the same puzzle in 7 minutes 28 seconds.

Seeta says,

'I did the puzzle in less than half the time Ninal did the puzzle.'

- (b) Is Seeta right?  
You must show all your working.

Seeta : 3 minutes 45 seconds  
(x2) 6 minutes 90 seconds ← This makes no sense  
1 minute = 60 seconds ∴ 7 minutes 30 seconds  
Conclusion: Seeta is wrong since her doubled time is greater than Ninal's time.

(3)

(Total 4 marks)

15. Work out  $\frac{3}{4} + \frac{1}{8}$

Adding Fractions

Give your answer in its simplest form.

$$\begin{array}{l} \text{LCM of 4 and 8} = 8 \\ \frac{3}{4} = \frac{6}{8} \end{array} \quad \left| \quad \begin{array}{l} \frac{3}{4} + \frac{1}{8} = \frac{?}{8} + \frac{?}{8} \\ = \frac{6}{8} + \frac{1}{8} = \frac{7}{8} \end{array} \right.$$

(Total 2 marks)

## Converting and Ordering FDP

16. Write these numbers in order of size.  
Start with the smallest number.

①	④	③	②
0.6	$\frac{2}{3}$	65%	0.606

Convert      0.6    0.666    0.65    0.606

order        0.6    0.606    0.65    0.666

.....  
0.6, 0.606, 65%,  $\frac{2}{3}$

(Total 2 marks)

17. One kilogram of cheese costs £5.60.  
Jane buys 200 g of cheese.

Decimal Division

Work out how much Jane pays.

1kg	1kg = £5.60	$\begin{array}{r} 1.12 \\ 5 \overline{) 5.60} \end{array}$
(÷5)	200g = <u>£1.12</u>	

£ 1.12 .....

(Total 3 marks)

# Fractions and Percentages of an Amount

18. Mr Brown and his 2 children are going to London by train.

An adult ticket costs £24.

A child ticket costs £12.

Mr Brown has a Family Railcard.

**Family Railcard gives**

$\frac{1}{3}$  off adult tickets

60% off child tickets

Work out the total cost of the tickets when Mr Brown uses his Family Railcard.

<u>1 adult ticket</u>	£24 but $\frac{1}{3}$ off	
$\frac{1}{3}$ of £24 = £8	£24 - £8 = <u>£16</u>	
<u>2 child tickets</u>	2 x £12 = £24 but 60% off.	
(÷10)	£24 = 100%	
(x6)	£2.40 = 10%	
	£14.40 = 60%	
	£24 - £14.40 = <u>£9.60</u>	$\begin{array}{r} 2.40 \times \\ \quad 6 \\ \hline 14.40 \\ \quad 2 \end{array}$
Total price	£16 + £9.60 = <u>£25.60</u>	
		£ <u>25.60</u> .....

(Total 4 marks)

19. Work out  $4.52 \times 36$

↓

$$\begin{array}{l} \underline{\underline{\times 100}} \\ = 452 \times 36 \end{array}$$

$$\begin{array}{r} 452 \\ 36 \times \\ \hline 2712 \\ 23560 \\ \hline 16272 \end{array}$$

↓  $\underline{\underline{\div 100}}$

162.72

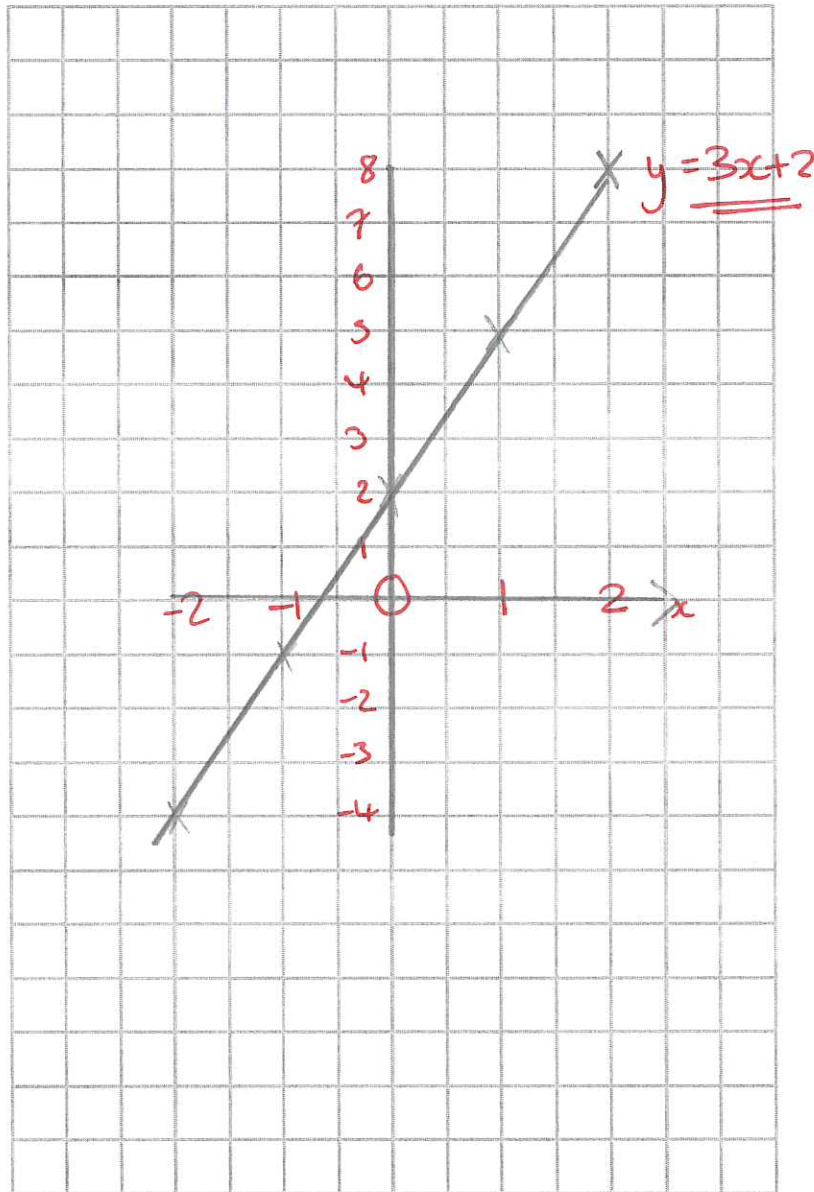
(Total 3 marks)

# Plotting Straight Lines

20. On the grid, draw the graph of  $y = 3x + 2$  for values of  $x$  from  $-2$  to  $2$ .

$x$	$-2$	$-1$	$0$	$1$	$2$
$y$	$-4$	$-1$	$2$	$5$	$8$

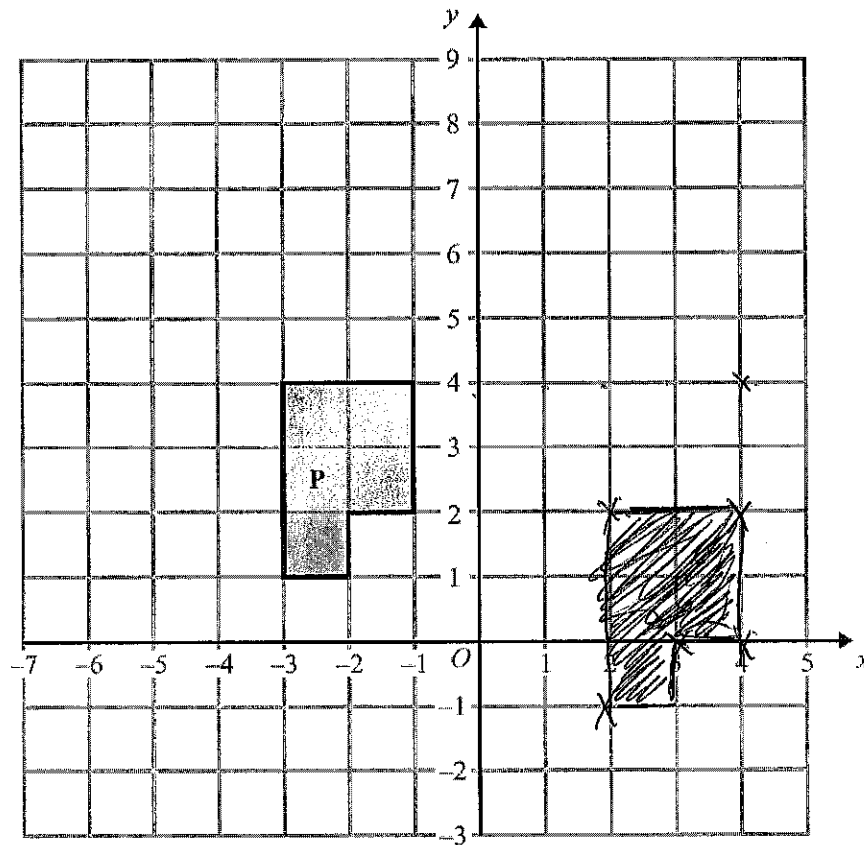
$y = 3x + 2$   
 $x=0: y=3(0)+2=2$   
 $x=1: y=3(1)+2=5$   
 $x=2: y=3(2)+2=8$   
← use the pattern!



(Total 4 marks)

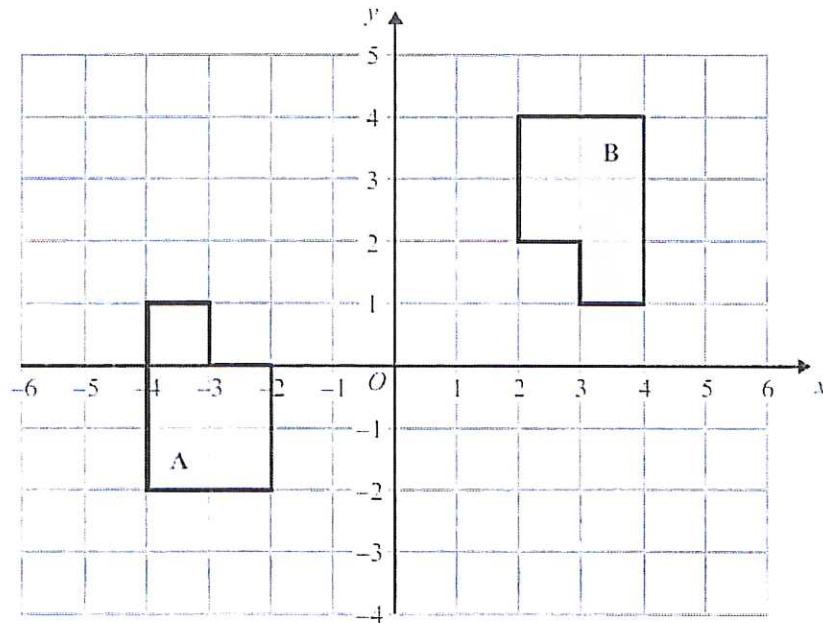
# Transformations

21.



(a) Translate shape P by the vector  $\begin{pmatrix} 5 \\ -2 \end{pmatrix}$ . 5 right  
2 down.

(2)



(b) Describe fully the single transformation that maps shape A onto shape B.

Rotation  $180^\circ$  centre (0,1)

(3)

(Total 5 marks)

6. (a) Simplify

$$\frac{(x+2)^2}{x+2}$$

Simplifying Algebraic Expressions

$$\frac{y^2}{y} = y$$

$$\therefore \frac{(x+2)^2}{x+2} = x+2$$

$$\frac{x+2}{1} = x+2$$

(1)

(b) Simplify

$$2a^2b \times 3a^3b$$

$$= 2 \times a \times a \times b \times 3 \times a \times a \times a \times b$$

$$= 6a^5b^2$$

(2)

(Total 3 marks)



## Sharing Ratios

23. Talil is going to make some concrete mix.  
He needs to mix cement, sand and gravel in the ratio 1 : 3 : 5 by weight.

Talil wants to make 180 kg of concrete mix.

Talil has

15 kg of cement

85 kg of sand

100 kg of gravel

Does Talil have enough cement, sand and gravel to make the concrete mix?

Total Parts ( $\div 9$ )	$1+3+5 = 9 \text{ parts} = 180 \text{ kg}$ $1 \text{ part} = 20 \text{ kg}$				
C : S : G  ( $\times 20$ )	$= 1 : 3 : 5$  $20 : 60 : 100$				
Conclusion	<table style="width: 100%; border: none;"> <tr> <td style="text-align: center; width: 50%;"><u>NEEDS</u></td> <td style="text-align: center; width: 50%;"><u>HAS</u></td> </tr> <tr> <td style="text-align: center;"><math>20 : 60 : 100</math></td> <td style="text-align: center;"><math>15 : 85 : 100</math></td> </tr> </table> <p>He does not have enough cement, <u>NO</u></p>	<u>NEEDS</u>	<u>HAS</u>	$20 : 60 : 100$	$15 : 85 : 100$
<u>NEEDS</u>	<u>HAS</u>				
$20 : 60 : 100$	$15 : 85 : 100$				

(Total 4 marks)

24. The height,  $H$  cm, of a table is measured as 72 cm correct to the nearest centimetre. Error Intervals

Complete the following statement to show the range of possible values of  $H$ .

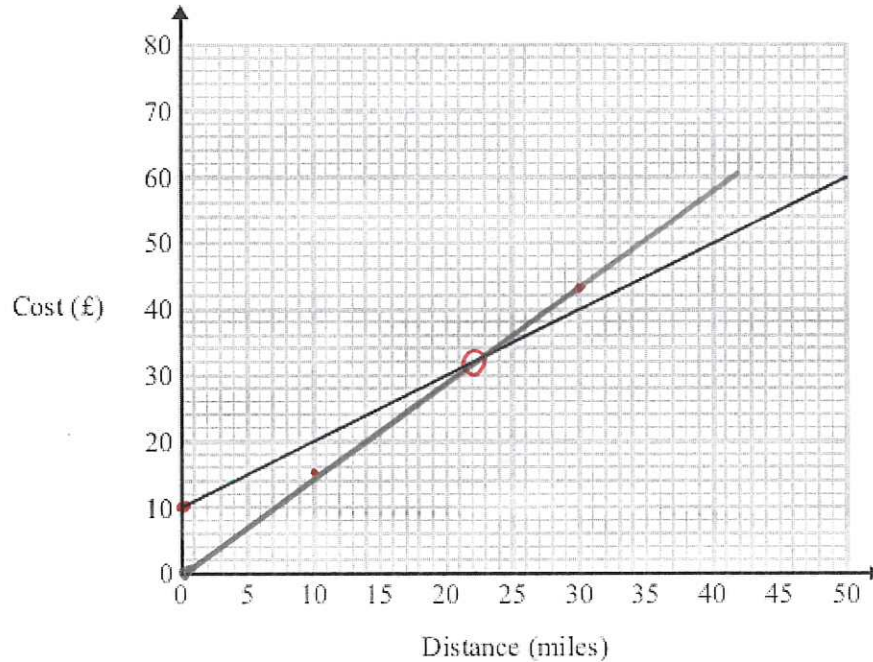
$  \begin{array}{r}  +0.5 \\  \hline  72 \\  \hline  -0.5  \end{array}  $	$  \begin{array}{r}  72.5 \\  \\  71.5  \end{array}  $	$1 \div 2 = 0.5$
$\dots\dots\dots 71.5 \leq H < 72.5 \dots\dots\dots$		

(Total 2 marks)

# Interpreting Real Life Graphs

25. Bill uses his van to deliver parcels.  
For each parcel Bill delivers there is a fixed charge plus £1.00 for each mile.

You can use the graph to find the total cost of having a parcel delivered by Bill.



- (a) How much is the fixed charge?

£ 10 ..... (1)

Ed uses a van to deliver parcels.  
For each parcel Ed delivers it costs £1.50 for each mile.  
There is **no** fixed charge.

- (b) Compare the cost of having a parcel delivered by Bill with the cost of having a parcel delivered by Ed.

Draw Ed Line

(x10)  
(x3)

Ed: £0 = 0 miles  
£1.50 = 1 mile  
£15 = 10 miles  
£45 = 30 miles

(3)

Conclusion:

It is cheaper to have parcels delivered by Ed up until parcels 22 miles away. After that Bill is the cheaper choice. (Total 4 marks)

5  
plication)

9. Sasha carried out a survey of 60 students.  
She asked them how many CDs they each have.

Averages From Grouped  
Frequency

This table shows information about the numbers of CDs these students have.

Number of CDs	0-4	5-9	10-14	15-19	20-24
Frequency	8	11	9	14	18

C.f. 8 19 28 42 60

- (a) Write down the class interval containing the median.

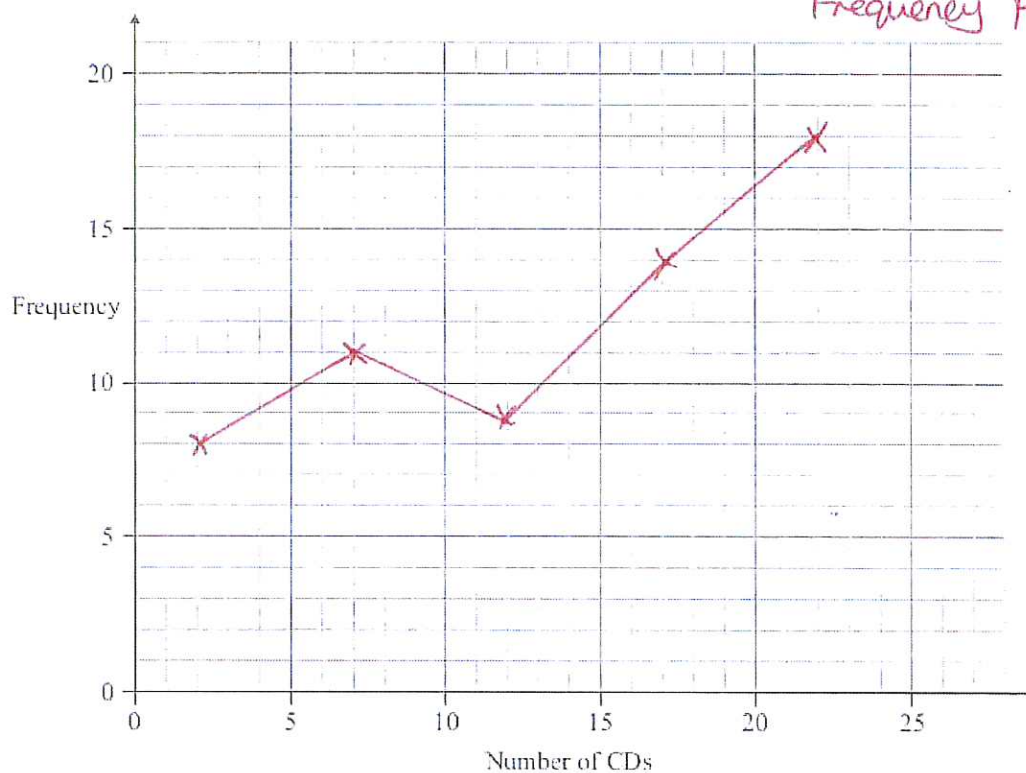
$$\text{median} = \frac{n}{2} = \frac{60}{2} = 30^{\text{th}} \text{ student}$$

15-19

$\Rightarrow$  students 29-42 are in 15-19 class  $\therefore$  15-19 (1)

- (b) On the grid, draw a frequency polygon to show the information given in the table.

Frequency Polygon



midpoints!

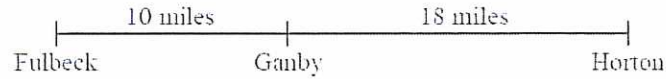
(2)

(Total 3 marks)

# Speed Distance Time



13. The distance from Fulbeck to Ganby is 10 miles.  
The distance from Ganby to Horton is 18 miles.



Raksha is going to drive from Fulbeck to Ganby.  
Then she will drive from Ganby to Horton.

Raksha leaves Fulbeck at 10 00.  
She drives from Fulbeck to Ganby at an average speed of 40mph.

Raksha wants to get to Horton at 10 35.

Work out the average speed Raksha must drive at from Ganby to Horton.

Journey 1

$$\begin{aligned} S &= 40 \text{ mph} \\ D &= 10 \text{ miles} \\ T &= ? \text{ ①} = 15 \text{ minutes} \end{aligned}$$

Journey 2

$$\begin{aligned} S &= ? \text{ ③} \\ D &= 18 \text{ miles} \\ T &= 20 \text{ minutes ②} \end{aligned}$$

$$\text{① } T = \frac{D}{S}$$

$$T = \frac{10 \text{ miles}}{40 \text{ mph}}$$

$$= \frac{1}{4} \text{ hours}$$

$$= 15 \text{ minutes}$$

$$\text{② } T = 35 \text{ mins} - 15 \text{ mins} = 20 \text{ minutes}$$

$$\text{③ } S = \frac{D}{T}$$

$$S = \frac{18 \text{ miles}}{20 \text{ minutes}} = \underline{54 \text{ mph}}$$

.....54.....mph

(Total 3 marks)

## Index Laws

29. (a) Write down the value of  $5^0$

$$a^0 = 1$$

..... 1  
(1)

- (b) Write down the value of  $2^{-1}$

$$a^{-m} = \frac{1}{a^m} \quad | \quad 2^{-1} = \frac{1}{2^1} = \frac{1}{2}$$

.....  $\frac{1}{2}$   
(1)

(Total 2 marks)

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**TOTAL FOR PAPER IS 80 MARKS**