Worthing College

Getting Ready For MATHEMATICS in CONTEXT

Name		
MATHEMATICS in CONTEXT	**STATISTICS REQUIRED**	**Summer Holiday Work**

We are delighted you have chosen to study Mathematics in Context at Worthing College.

Instructions: This pack will help you make the best possible start to studying this subject.

The tasks in this pack:

- should take you **about 4 hours to complete.**
- should be handed in to your teacher when teaching starts – ***your first lesson in September*** – with your name on it for assessment.
- are available on the internet – follow the links in the document.

If you need help: The tasks are designed to get a bit more difficult as you work through them as they are preparing you for studying at a higher level and to become an effective independent learner. You should try to get as far as you can working on your own but if you do need help, please email us at n.redmayne@worthing.ac.uk, telling us which task you are working on and what help you need. Help is available throughout the summer holidays.

Skills Focus for this Getting Ready for Pack	

• **The ability to choose the correct method to solve a problem.**
• **Your quality of English communication when a written answer is required.**
• **Clarity of mathematical communication – how well you show your workings and lay out your work.**
• **Accuracy of numerical calculations.**
• **Marking and correcting your work, revising any topics you have forgotten.**
	• **GCSE subject knowledge, including:**
	  ○ **Algebra**
	  ○ **Solving Quadratics**
	  ○ **Solving Simultaneous Equations**
	  ○ **Statistics**
	  ○ **Series**

Textbooks: Textbooks are supplied when necessary.

Work Placement Week

All students are required to participate in a **compulsory** week-long work placement. It is recommended that the placement chosen is either relevant to your course, or relevant to what your future career aspirations are.

Work placement form submission deadline

All L2 and L3 students studying on triple or double courses will be given their work placement week dates by their course leaders when they start in September.

The deadline to submit your placement forms are as follows:

Date of work placement week	Deadline for returning completed form
December 2025	24th October 2025
January / February 2026	24th October 2025
March / April 2026	19th December 2025
May / June 2026	13th February 2026

All students studying 2 or more single subjects will have the option of either carrying out their work placement during:

- February half term
- Easter holidays
- May half term
- 22nd – 26th June 2026

The deadline to submit your placement forms are as follows:

Date of work placement week	Deadline for returning completed form
February half term (16th - 20th Feb)	Friday 24th October 2025
Easter holidays (27th March - 13th April)	Friday 19th December 2025
May half term (26th - 29th May)	Friday 13th February 2026
22nd – 26th June	Friday 1st May 2026

Summer work – Introduction to Mathematics in Context

Target Grade	Type of task	Task	Deadline
All	Sequences and Geometric Questions	**GCSE Questions** • Answer all of the questions (on lined paper) and bring your work to your first maths lesson. • Answers are provided so use a different coloured pen to mark and correct your work.	First week of teaching in September
	Use of a Calculator	Questions to encourage familiarity with the calculator. You are advised at this level to have a **Classwiz fx-991 CW**	
8 or 9 at GCSE	GRFP Test Questions	These are set for you to bring to class. They will be marked by me at the start of term. To be able to do these questions you will need to think back to your GCSE statistics.	First week of teaching in September

Notes:

Clearly label all pages with your name and arrange them in the correct order. You do not need to print the question sheets although you may choose to do so for your own records. Please do not hand in the question sheets.

Resources To Help You

For each of the topic areas, there are videos you can watch which will introduce the aspects of the topic and then give you the opportunity to try some questions. Even though these videos are online, you should have a pen and paper nearby for your working.

You can find these videos on mrcorbettmaths.com . Just go to the GCSE maths section and search for the topic you are interested in.

SEQUENCES – EXAM QUESTIONS HOMEWORK **HIGHER**

1. Find the n^{th} term of the following sequences.

(a) 1, 4, 9, 16, 25, …

(1)

(b) –2, 1, 6, 13, 22, …

(1)

(Total 2 marks)

2. Annie, Bert and Chari are investigating the number sequence 21, 40, 65, 96, 133, …

(a) Annie has found the following pattern.

1st term	1	×	2	+	3^2	+	2	×	5 = 21
2nd term	2	×	3	+	4^2	+	3	×	6 = 40
3rd term	3	×	4	+	5^2	+	4	×	7 = 65
4th term	4	×	5	+	6^2	+	5	×	8 = 96
5th term	5	×	6	+	7^2	+	6	×	9 = 133

Complete the *n*th term for Annie's pattern.

*n*th term $n \times (n + 1) +$ ..... $+$ ..... $\times$ .....

(2)

(b) Bert has found this formula for the *n*th term

$$(3n + 1)(n + 3) + 5$$

HINT – Expand and simplify both formulae

Chari has found this formula for the *n*th term

$$(2n + 3)^2 - (n + 1)^2$$

Prove that these two formulae are equivalent.

(3)

(Total 5 marks)

3. Each term of a Fibonacci sequence is formed by adding the previous two terms.

1, 1, 2, 3, 5, 8, 13, 21, ……

A Fibonacci sequence starts a, b, $a + b$, …

(a) Use algebra to show that the 6th term of this Fibonacci sequence is $3a + 5b$

(2)

(b) Use algebra to prove that the difference between the 9th term and 3rd term of this sequence is four times the 6th term.

(3)

(Total 5 marks)

4. The triangle number sequence is

HINT – Replace 'n' with 'n-1' in the formula

1, 3, 6, 10, 15, 21, …

The *n*th term of this sequence is given by

$$\frac{1}{2} n(n + 1)$$

(a) Write down an algebraic expression for the $(n – 1)$th term of the sequence.

Answer .....

(1)

(b) Prove, algebraically, that the sum of any two consecutive triangle numbers is a square number.

(3)

(Total 4 marks)

SEQUENCES – EXAM QUESTIONS HOMEWORK - ANSWERS **HIGHER**

1. Find the n^{th} term of the following sequences.

(a) 1, 4, 9, 16, 25, … n^2

(1)

(b) –2, 1, 6, 13, 22, … n^2-3

(1)

(Total 2 marks)

2. Annie, Bert and Chari are investigating the number sequence 21, 40, 65, 96, 133, …

(a) Annie has found the following pattern.

1st term	1	×	2 +	3^2 +	2	×	5 =	21
2nd term	2	×	3 +	4^2 +	3	×	6 =	40
3rd term	3	×	4 +	5^2 +	4	×	7 =	65
4th term	4	×	5 +	6^2 +	5	×	8 =	96
5th term	5	×	6 +	7^2 +	6	×	9 =	133

Complete the *n*th term for Annie's pattern.

*n*th term $n \times (n+1) +$ .....(n+2)^2... + ...(n+1)..... × .....(n+4).....

(2)

(b) Bert has found this formula for the *n*th term

$(3n + 1)(n + 3) + 5$ 3n^2+10n+8

HINT – Expand and simplify both formulae

Chari has found this formula for the *n*th term

$(2n + 3)^2 – (n + 1)^2$ 4n^2+12n+9-n^2-2n-1

Prove that these two formulae are equivalent. =3n^2+10n+8

Both equations are the same

(3)

(Total 5 marks)

3. Each term of a Fibonacci sequence is formed by adding the previous two terms.

1, 1, 2, 3, 5, 8, 13, 21, ……

A Fibonacci sequence starts *a*, *b*, *a* + *b*, ..a+2b, 2a+3b, 3a+5b,....

(a) Use algebra to show that the 6th term of this Fibonacci sequence is 3*a* + 5*b*

(2)

(b) Use algebra to prove that the difference between the 9th term and 3rd term of this sequence is four times the 6th term.

...3a+5b, 5a+8b, 8a+13b, 13a+21b,....

13a+21b-(a+b)=12a+20b

=4(3a+5b) ie 4x the 6th term.

(3)

(Total 5 marks)

4. The triangle number sequence is

1, 3, 6, 10, 15, 21, …

HINT – Replace 'n' with 'n-1' in the formula

The *n*th term of this sequence is given by

$\frac{1}{2} n(n + 1)$

(a) Write down an algebraic expression for the $(n – 1)$th term of the sequence.

Answer 0.5(n-1)(n)……

(1)

(b) Prove, algebraically, that the sum of any two consecutive triangle numbers is a square number.

0.5n(n+1)+0.5n(n-1)

=0.5n^2+0.5n+0.5n^2-0.5n

=n^2 ie a square number

(3)

(Total 4 marks)

CHECK IT

Geometric Sequences

1) Find the common ratio for the sequence 2, 18, 162, 1458

2) A Geometric sequence has a first term of 3 and a common ratio of 5. Find the 2nd term.

3) Find the next term in the sequence 3, 6, 12, …

4) Find the common ratio for the sequence 5, 15, 45, 135

5) Find the first term of the sequence ?, 60, 240, 960

6) A Geometric sequence has a first term of 16 and a common ratio of 0.5. Find the 2nd term.

7) Find the common ratio for the sequence 5, 30, 180, 1080

8) Find the next term in the sequence 5, 15, 45, …

9) Find the first term of the sequence ?, 32, 64, 128

10) Find the common ratio for the sequence 500, 100, 20, 4

11) A Geometric sequence has a first term of 4 and a common ratio of 2. Find the 4th term.

12) A Geometric sequence has a first term of 3 and a common ratio of 5. Find the 3rd term.

13) Find the first term of the sequence ?, 2, 8, 32

14) Find the common ratio for the sequence 4000, 1000, 250, 62.5

15) A Geometric sequence has a first term of 200 and a common ratio of 0.5. Find the 3rd term.

16) Find the next term in the sequence 5, 25, 125, …

17) Find the common ratio for the sequence 3, 6, 12, 24

18) Find the first term of the sequence ?, 1, 10, 100

19) Find the common ratio for the sequence 10, 50, 250, 1250

20) A Geometric sequence has a first term of 1 and a common ratio of 3. Find the 3rd term.

21) Find the first term of the sequence ?, 33, 99, 297

22) Find the next term in the sequence 2, 6, 18, …

23) Find the next term in the sequence 30000, 3000, 300, …

24) Find the next term in the sequence 2, 20, 200, …

25) Find the first term of the sequence ?, 10, 5, 2.5

26) Find the next term in the sequence 4000, 2000, 1000, …

27) Find the common ratio for the sequence 4, 16, 64, 256

28) Find the next term in the sequence 5, 20, 80, …

29) Find the first term of the sequence ?, 160, 640, 2560

30) A Geometric sequence has a first term of 2 and a common ratio of 6. Find the 4th term.

CHECK IT

Simplifying

ANSWERS

1)	9	2)	15
3)	24	4)	3
5)	15	6)	8
7)	6	8)	135
9)	16	10)	0.2
11)	32	12)	75
13)	0.5	14)	0.25
15)	50	16)	625
17)	2	18)	0.1
19)	5	20)	9
21)	11	22)	54
23)	30	24)	2000
25)	20	26)	500
27)	4	28)	320
29)	40	30)	432

Name:

Exam Style Questions

Use of a Calculator

Corbettmaths

Equipment needed: Calculator, pen

Guidance

1. Read each question carefully before you begin answering it.
2. Check your answers seem right.
3. Always show your workings

Video Tutorial

www.corbettmaths.com/contents

Video 352

Answers and Video Solutions

1. Find the value of 86^2

.....

(1)

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2. Find the value of $\sqrt{2209}$

.....

(1)

---

3. Find the value of $\sqrt[3]{614.125}$

.....

(1)

---

4. Find the value of 3^{10}

.....

(1)

5. Calculate $\sqrt{62}$ correct to 1 decimal place.

.....

(2)

---

6. Find the value of $\sqrt{7.84} + 6.5^2$

Give your answer as a decimal.

.....

(2)

---

7. Find the value of each of the following.

Give each answer as a decimal.

(a) 8.3^2

.....

(1)

(b) $5.2(3.8 - 2.7)$

.....

(1)

(c) $\dfrac{2}{3.2}$

.....

(1)

8. Calculate each of the following.
Give each answer as a decimal.

(a) $\dfrac{5}{0.4^2}$

.....

(2)

(b) $5.2^3 + \sqrt{5655.04}$

.....

(2)

---

9. Work out $\dfrac{1.9 \times 121.5}{30 - 4.35}$

.....

(2)

---

10. Use your calculator to work out the value of

$$\frac{2.12 \times 5.2}{9.21 - 2.8}$$

Give your answer as a decimal.
Write down all the figures on your calculator display.

.....

(2)

11. Use your calculator to work out $\dfrac{7.2}{9.1 \times 2.8}$ as a decimal.

(a) Write down all the figures on your calculator display.

.....

(1)

(b) Write your answer to 1 decimal place.

.....

(1)

---

12. Work the value of $\dfrac{13.2 + 8.9}{2.3^2}$ as a decimal.

(a) Write down all the figures on your calculator display.

.....

(1)

(b) Write your answer to 1 decimal place.

.....

(1)

---

13. Calculate $\sqrt[3]{80.43^2}$

Give your answer to 3 decimal places.

.....

(2)

14. Calculate the value of $\dfrac{183 + 892}{10.4 \times 8.75}$ as a decimal

(a) Write down all the figures on your calculator display.

.....

(1)

(b) Write your answer to 2 decimal places.

.....

(1)

---

15. Work out $13 \div 0.3^2$ as a decimal

(a) Write down all the figures on your calculator display.

.....

(1)

(b) Give your answer to the nearest whole number.

.....

(1)

---

16. Work out $7 \times \sqrt{3}$

Give your answer as a decimal.
Write down all the figures from your calculator display.

.....

(1)

17. Use your calculator to work out

(a) 3^6

.....

(1)

(b) the reciprocal of 1.5

.....

(1)

(c) the cube root of 6859

.....

(1)

---

18. Calculate the value of

$$\frac{13.2 - 1.29}{39.1 - 44.8}$$

Give your answer as a decimal.

(a) Write down all the figures from your calculator display.

.....

(1)

(b) Give your answer to three significant figures.

.....

(1)

19. Use your calculator to find

$$\sqrt{39.3^2 - 1.24^2}$$

(a) Give all the figures on your calculator display.

.....

(1)

(b) Write your answer to 3 significant figures.

.....

(1)

---

20. Calculate $\sqrt[4]{100 - 2.4^3}$

.....

(2)

---

21. Use your calculator to work out $\dfrac{91^2 - 3.9}{\sqrt{162 - 4.5^3}}$

(a) Give all the figures on your calculator display.

.....

(1)

(b) Write your answer to 3 significant figures.

.....

(1)

22. (a) Use your calculator to work out $\dfrac{398}{1.98^3} - \sqrt{102}$

Give your answer as a decimal.
Write all the figures on your calculator display.

.....

(1)

(b) By rounding 398, 1.98 and 102 to 1 significant figure, check that your answer to (a) is sensible.
Your must show your workings.

(2)

---

23. Calculate $\sqrt{\dfrac{9080}{(4.7 - 0.866)^3}}$

Give your answer correct to 3 significant figures.

.....

(3)

24. (a) Use your calculator to work out $\dfrac{5.03 \times 8.991}{0.4987} - \sqrt[3]{998.6}$

Give your answer as a decimal.
Write all the figures on your calculator display.

.....

(1)

(b) Use approximations to show that your answer to part (a) is sensible.
Your must show your workings.

(2)

---

25. Using a calculator, work out

$$\sqrt{\frac{sin82^\circ}{cos82^\circ}}$$

Write your answer to 3 significant figures.

.....

(2)

26. Use your calculator to work out $\sqrt{\frac{cos81^\circ + cos7^\circ}{sin81^\circ - sin7^\circ}}$

(a) Give all the figures on your calculator display.

.....

(2)

(b) Write your answer to 3 significant figures.

.....

(1)

---

27. Using a calculator, work out

$$\sqrt{\frac{9.44 \times cos124^\circ}{3.5^4 - 190}}$$

Write your answer to 3 significant figures.

.....

(2)

(Name:)

Exam Style Questions

Use of a Calculator

Corbettmaths

Equipment needed: Calculator, pen

Guidance

1. Read each question carefully before you begin answering it.
2. Check your answers seem right.
3. Always show your workings

Video Tutorial

www.corbettmaths.com/contents

Video 352

Answers and Video Solutions

1. Find the value of 86^2

"

7396

(1)

2. Find the value of y22fJ9

It

(1)

3. Find the value ot-yf 614.125

it

8.5

(1)

4. Find the value of 3^{10}

59049

(1)

5. Calculate $\sqrt{62}$ correct to 1 decimal place.

7.874007874

(2)

6. Find the value of $y'7M + 6.5^2$

Give your answer as a decimal.

45.05

(2)

7. Find the value of each of the following.
Give each answer as a decimal.

(a) $\mathbf{8.3^2}$

68.89

(1)

(b) $5.2(3.8 - 2.7)$

5.72

(1)

(c) 3.2^{2}

0.625

(1)

8. Calculate each of the following.
Give each answer as a decimal.

(a) $\frac{5}{0.42}$

31.25

(2)

(b) $5.2^3 + \sqrt{5655.04}$

215.808

(2)

9. Work out $\frac{1.9 \times 121.5}{30 - 4.35}$

q

(2)

10. Use your calculator to work out the value of

$$\frac{2.12 \times 5.2}{9.21 - 2.8}$$

Give your answer as a decimal.
Write down all the figures on your calculator display.

1.719812793

(2)

11. Use your calculator to work out $\frac{7.2}{9.1 \times 2.8}$ as a decimal.

(a) Write down all the figures on your calculator display.

...0 .I. !...?.f..t—f..t... 1).....

(1)

(b) Write your answer to 1 decimal place.

0-)

(1)

12. Work the value of $\frac{13.2 + 8.9}{2.3^2}$ as a decimal.

(a) Write down all the figures on your calculator display.

4--177-bfJl-&2

(1)

(b) Write your answer to 1 decimal place.

4.2

(1)

13. Calculate $\sqrt{80.43^2}$

Give your answer to 3 decimal places.

18.6328532

18.633

(2)

14. Calculate the value of $\frac{183 + 892}{10.4 \times 8.75}$ as a decimal

(a) Write down all the figures on your calculator display.

11.813186 81

(1)

(b) Write your answer to 2 decimal places.

11.81

(1)

15. Work out $13 \div 0.3^2$ as a decimal

(a) Write down all the figures on your calculator display.

...../. . (.:..1/..((.. ..0..Lf.....

(1)

(b) Give your answer to the nearest whole number.

144

(1)

16. Workout $7x\sqrt{3}$

Give your answer as a decimal.
Write down all the figures from your calculator display.

.../..1:..1.i .4.?.. / .....

(1)

17. Use your calculator to work out

t'''

(a) 3^6

729

(1)

(b) the reciprocal of 1.5

$\frac{1}{1.5}$ $\frac{2}{3}$

(1)

(c) the cube root of 6859

(1)

18. Calculate the value of

I''

$$\frac{13.2-1.29}{39.1 - 44.8}$$

Give your answer as a decimal.

(a) Write down all the figures from your calculator display.

- J. oet1/.;7-J6·6

(1)

(b) Give your answer to three significant figures.

-2.09

(1)

19. Use your calculator to find

$$\sqrt{39.3^2 - 1.24^2}$$

(a) Give all the figures on your calculator display.

39.280 43279

(1)

(b) Write your answer to 3 significant figures.

39.3

(1)

20. Calculate $\sqrt{100} - 2.4^3$

3.046818493

(2)

21. Use your calculator to work out $\dfrac{91^2 - 3.9}{\sqrt{162} - 4.5^3}$

(a) Give all the figures on your calculator display.

983.1769002

(1)

(b) Write your answer to 3 significant figures.

...q.. </_ 3...

(1)

22. (a) Use your calculator to work out $\frac{39}{1.98}$ -yi02

Give your answer as a decimal.
Write all the figures on your calculator display.

4,.1133t;"o13

(1)

(b) By rounding 398, 1.98 and 102 to 1 significant figure, check that your answer to (a) is sensible.
Your must show your workings.

400

(2)

23. Calculate $\frac{9080}{(4.7 - 0.866)3}$

Give your answer correct to 3 significant figures.

12.69301407

12.7

(3)

24. (a) Use your calculator to work out $\frac{5.03 \times 8.991}{0.4987} - \sqrt{998.6}$

Give your answer as a decimal.
Write all the figures on your calculator display.

80.689991047

(1)

(b) Use approximations to show that your answer to part (a) is sensible.
Your must show your workings.

(2)

25. Using a calculator, work out

$$\sqrt{\frac{\sin 82°}{\cos 82°}}$$

Write your answer to 3 significant figures.

2.667465037

2.67

(2)

26. Use your calculator to work out $\sqrt{\frac{\cos 81^\circ + \cos ?^\circ}{\sin 81^\circ - \sin 7^\circ}}$

I'

(a) Give all the figures on your calculator display.

1.151974315

(2)

(b) Write your answer to 3 significant figures.

1.15

(1)

---

27. Using a calculator, work out

ffl/

$$\sqrt{\frac{9.44 \times \cos 124^\circ}{3.5^4 - 190}}$$

Write your answer to 3 significant figures.

?.363560243

0.3tff

(2)

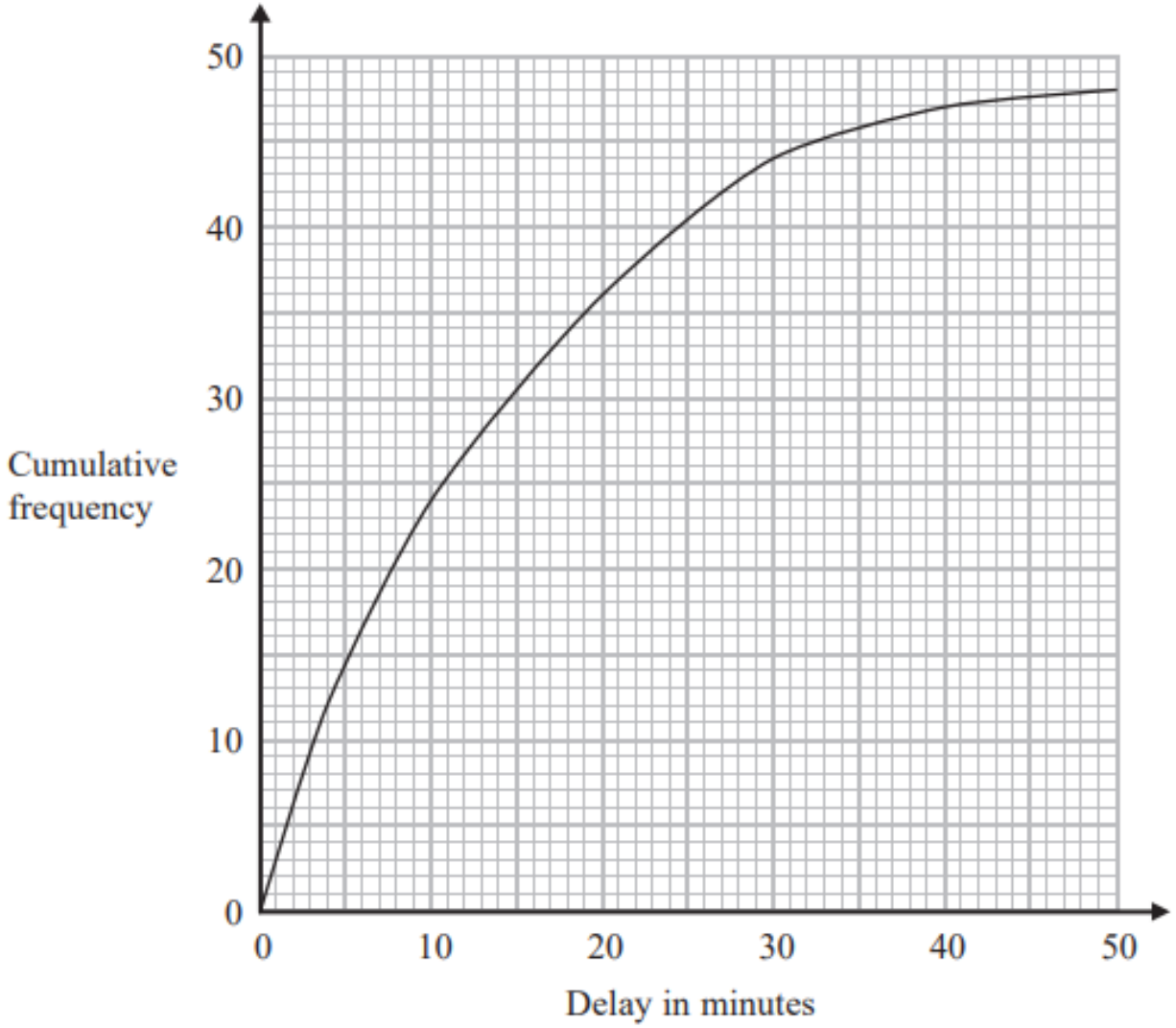
Please attempt all questions. We will go through the answers in our first lesson.

(9 Questions 38 marks)

1.

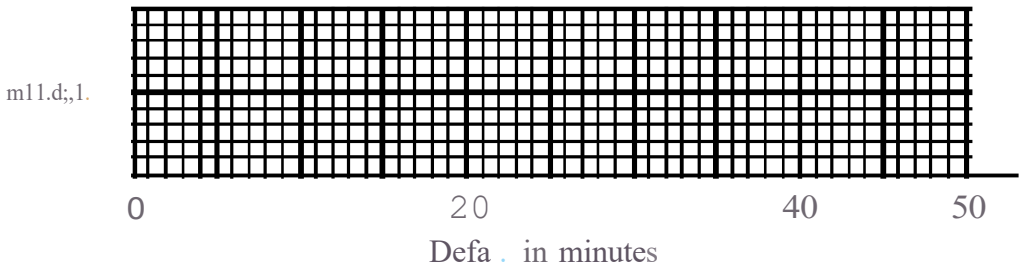
The times that 48 trains left a station on Monday were recorded.

The cumulative frequency graph gives information about the numbers of minutes the trains were delayed, correct to the nearest minute.



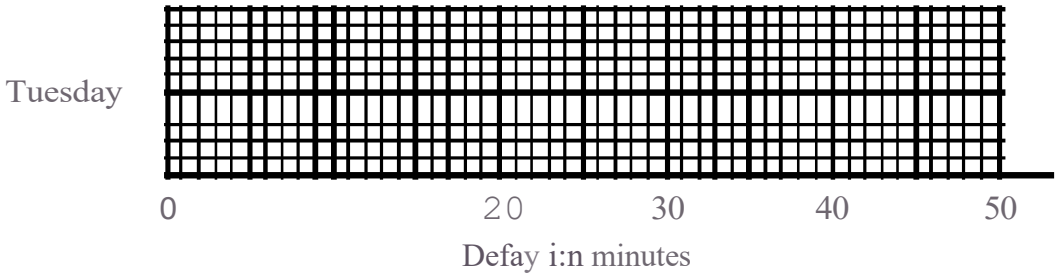
The shortest delay was 0 minutes.
The longest delay was 42 minutes.

a) On th grid b e1o drn° 1 ho"" p1o1 for **h** information .,ibo-**t** llhe dleJays 01.111 onda .



3)

48 lrnins]eft the M,i ion on Tuesday.
The box plot b lo gi es information ahoot llhe dlefays on Tuesda ..



,(b) Compare he distributiom of llhe cillelays on· onda v i **h** the distiriblllltion of the de Jays on Tuesda .

(2)

Mary says,

'1:lilie lomges diela . 01111 Ttlesda. v as 33 minutes.
'fil'h1is:means: that there mus:t b som delays of between 25 minll1 s: and 30 mi1111Ulites:. '

c) IDs Mar-. righ11t.
You ml!list give a Jie ison for your ans·- er.

(1)

6 mo.rk 1

2.

There are only green pens and blue pens in a box.

There are three more blue pens than green pens in the box.
There are more than 12 pens in the box.

Simon is going to take at random two pens from the box.

The probability that Simon will take two pens of the same colour is $\frac{27}{55}$

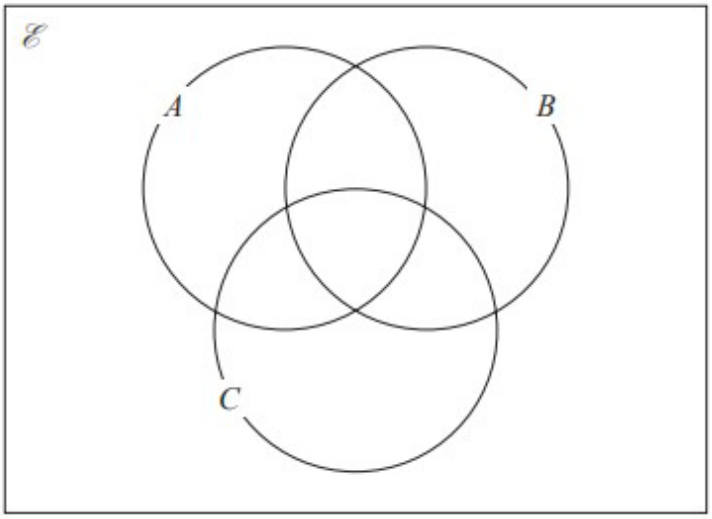
Work out the number of green pens in the box.

6 marks)

3.

$\mathscr{E}$ = {even numbers between 1 and 25}
A = {2, 8, 10, 14}
B = {6, 8, 20}
C = {8, 18, 20, 22}

(a) Complete the Venn diagram for this information.



(4)

A number is chosen at random from $\mathscr{E}$.

(b) Find the probability that the number is a member of $A \cap B$.

.....

(2)

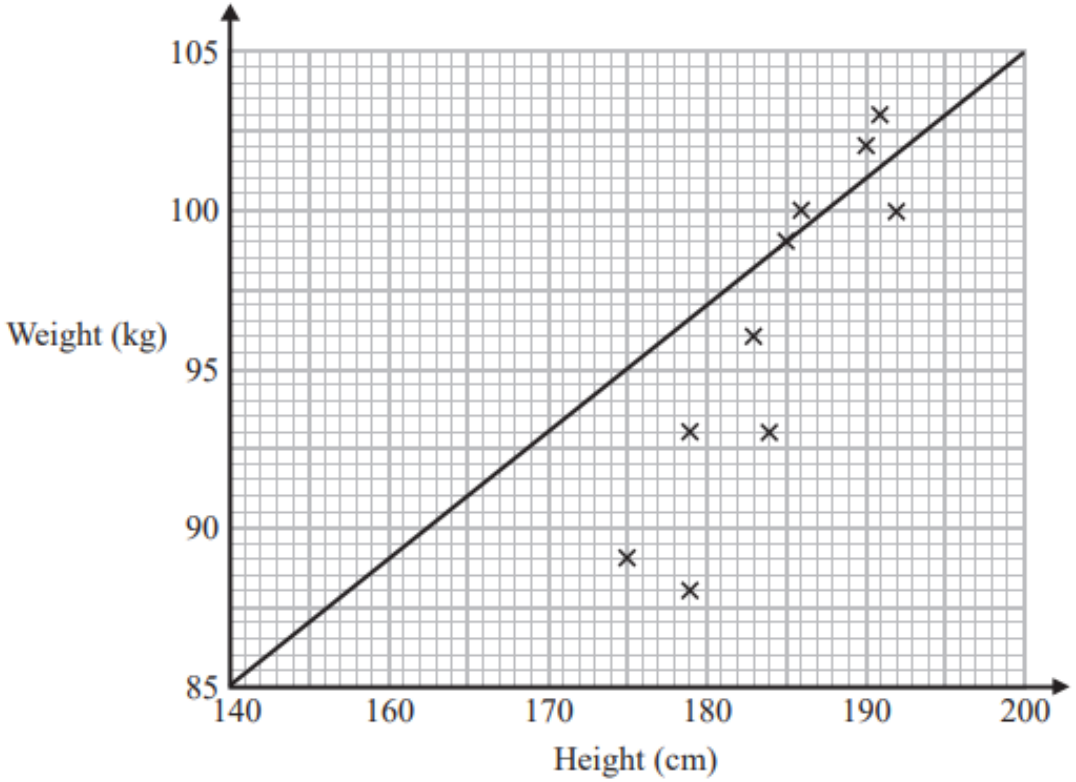
6 marks

4.

Sean has information about the height, in cm, and the weight, in kg, of each of ten rugby players.

He is asked to draw a scatter graph and a line of best fit for this information.

Here is his answer.



Sean has plotted the points accurately.

Write down two things that are wrong with his answer.

1 .....

.....

2 .....

.....

2 marks)

5.

There are only red counters and blue counters in a bag.

Joe takes at random a counter from the bag.
The probability that the counter is red is 0.65
Joe puts the counter back into the bag.

Mary takes at random a counter from the bag.
She puts the counter back into the bag.

(a) What is the probability that Joe and Mary take counters of different colours?

.....

(2)

There are 78 red counters in the bag.

(b) How many blue counters are there in the bag?

.....

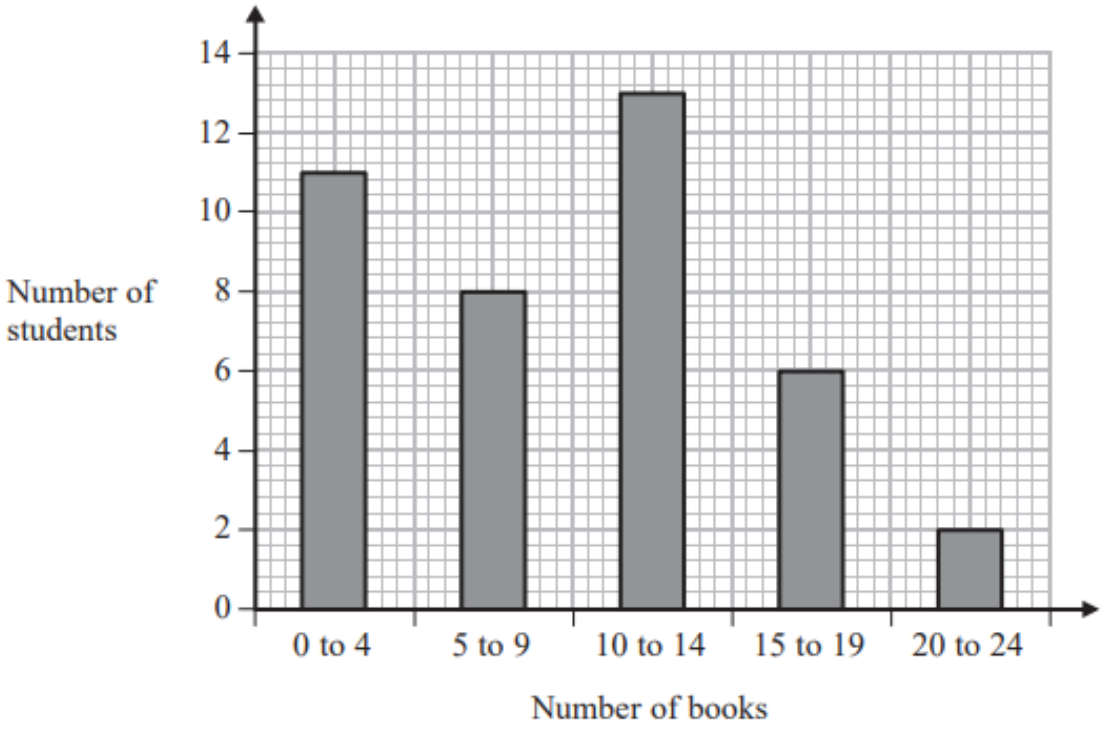
(2)

4 marks

6.

Fran asks each of 40 students how many books they bought last year.

The chart below shows information about the number of books bought by each of the 40 students.



(a) Work out the percentage of these students who bought 20 or more books.

.....%

(2)

fb) Sl11row that an es imate for tl11re rnea1111 number of ibooks bough1t is 9.5
You must shov aU your v orking.

( )

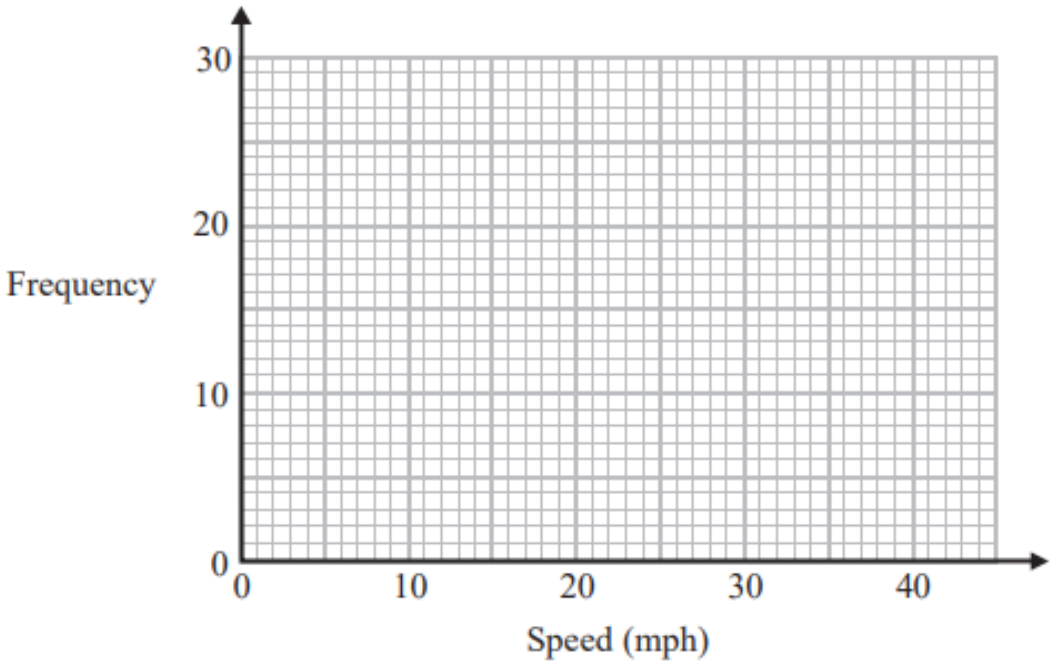
6 **marks)**

7.

The table gives information about the speeds of 70 cars.

Speed (s mph)	Frequency
$0 < s \leqslant 10$	14
$10 < s \leqslant 20$	18
$20 < s \leqslant 30$	26
$30 < s \leqslant 40$	12

Draw a frequency polygon for this information.



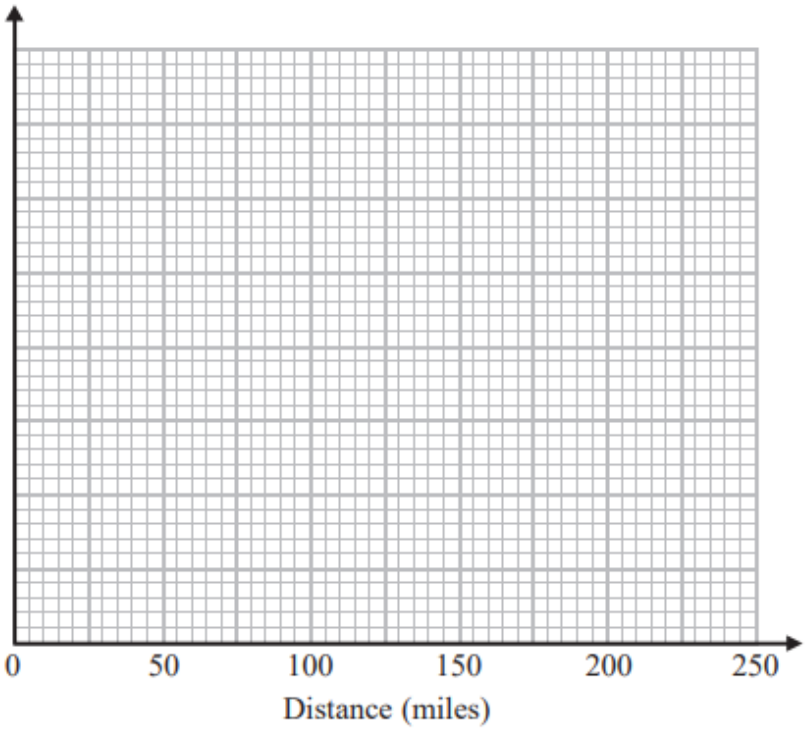
(Total for Question 7 is 2 marks)

8.

The table shows information about the distances 570 students travelled to a university open day.

Distance (d miles)	Frequency
$0 < d \leqslant 20$	120
$20 < d \leqslant 50$	90
$50 < d \leqslant 80$	120
$80 < d \leqslant 150$	140
$150 < d \leqslant 200$	100

(a) Draw a histogram for the information in the table.



(3)

(b) Estimate the median distance.

..... miles

(2)

5 marks

9.

Solve algebraically the simultaneous equations

$$2x^2 - y^2 = 17$$
$$x + 2y = 1$$

5 marks)