Countdown to your final Maths exam ...
Part 14 (2018)

	Marks	Actual	
Q1. Sequences (Clip 69)	**3**		
Q2. Forming & Solving equations (Clips 71& 72)	**5**		
Q3. Vectors (Clip 68)	**3**		
Q4. Sequences (Clip 69)	**4**		
Q5. Sequences (Clip 69)	**2**		
Q6. Sequences (Clip 69) / Forming & Solving equations (Clips 71& 72)	**3**		
Q7. Simultaneous equations (Clip 73 & 74)	**4**		
Q8. Sequences (Clip 69)	**2**		
Q9. Forming & Solving equations (Clips 71& 72)	**2**		
Q10. Forming & Solving equations (Clips 71& 72)	**2**		
Q11. Forming & Solving equations (Clips 71& 72)	**4**		
Q12. Forming & Solving equations (Clips 71& 72)	**2**		
Q13. Forming & Solving equations (Clips 71& 72)	**3**		
Q14. Sequences (Clip 69)	**4**		
Q15. Forming & Solving equations (Clips 71& 72)	**4**		
Q16. Forming & Solving equations (Clips 71& 72)	**4**		
Q17. Forming & Solving equations (Clips 71& 72)	**5**		
Q18. Forming & Solving equations (Clips 71& 72)	**5**		
Q19. Sequences (Clip 69)	**3**		
Q20. Simultaneous equations (Clip 73 & 74)	**4**		
Q21. Simultaneous equations (Clip 73 & 74)	**5**		
	73		

Questions

Q1. Here are the first 5 terms of an arithmetic sequence.

3 9 15 21 27

(a) Find an expression, in terms of *n*, for the *n*th term of this sequence.

(2)

Ben says that 150 is in the sequence.

(b) Is Ben right? You must explain your answer.

(1)

Q2. The size of the largest angle in a triangle is 4 times the size of the smallest angle.
The other angle is 27° less than the largest angle.

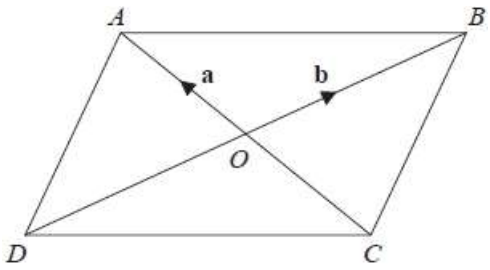
Work out, in degrees, the size of each angle in the triangle. You must show your working.

..... ° , ... ° , ... °

(5)

Q3. *ABCD* is a parallelogram. The diagonals of the parallelogram intersect at *O*.

$\overrightarrow{OA}$ = **a** and $\overrightarrow{OB}$ = **b**



(a) Find, in terms of **b**, the vector $\overrightarrow{DB}$.

(1)

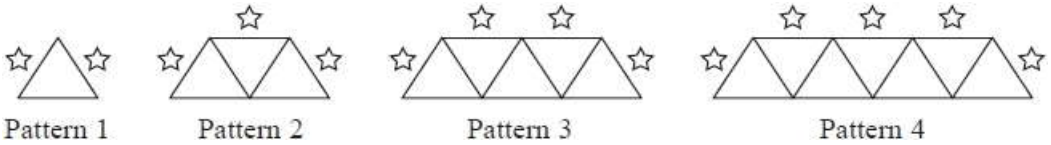
(b) Find, in terms of **a** and **b**, the vector $\overrightarrow{AB}$.

(1)

(c) Find, in terms of **a** and **b**, the vector $\overrightarrow{AD}$.

(1)

Q4. Here is a sequence of patterns made from triangles and stars.



(a) How many stars are needed for Pattern 5?

(1)

(b) How many triangles are needed for Pattern 6?

(1)

A pattern in the sequence is made from exactly 10 stars.

(c) How many triangles are needed for this pattern?

(2)

Q5. (i) Write down the next two terms in this number sequence.

100 95 90 85 ....

(ii) Explain how you got your answer.

(2)

Q6. n is a positive whole number.

(a) What type of positive whole number is $2n - 1$?

(1)

(b) Write down an expression for the nth multiple of 5

(1)

Alan has 4 boxes of cakes.
There is the same number of cakes in each box.
Alan has a total of t cakes.

(c) Write down an expression, in terms of t, for the number of cakes in each box.

(1)

Q7. 3 teas and 2 coffees have a total cost of £7.80
5 teas and 4 coffees have a total cost of £14.20

Work out the cost of one tea and the cost of one coffee.

(4)

Q8. Here are the first four terms of a number sequence.

6 10 14 18

Write an expression, in terms of n, for the nth term of this sequence.

(2)

Q9. Dan, Harry and Regan sell cars.

Dan sells x cars.
Harry sells 5 more cars than Dan.
Regan sells twice as many cars as Dan.

Write an expression, in terms of x, for the mean number of cars Dan, Harry and Regan sell.

(2)

Q10. Julie is x years old.
Kevin is $x + 3$ years old.
Omar is $2x$ years old.

Write an expression, in terms of x, for the mean of their ages.

(2)

Q11.

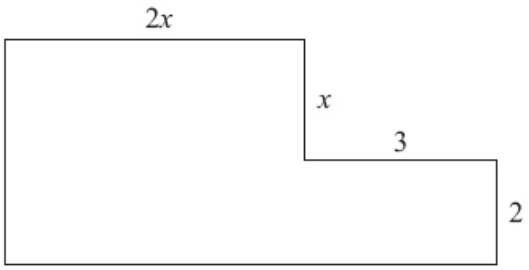


Diagram **NOT** accurately drawn

In the diagram, all measurements are given in centimetres.

All angles are right angles.

Show that the perimeter of the shape can be written as $2(3x + 5)$.

(4)

Q12. Katie has x pets.
Agatha has twice as many pets as Katie.
Isabel has 3 more pets than Katie.

Write an expression, in terms of x, for the total number of pets that Katie, Agatha and Isabel have.

(2)

Q13. Stephanie thinks of a positive number.
She squares the number and adds 7
The result is 43

What number did Stephanie think of?

(3)

Q14. Here are the first four terms of a number sequence.

4 7 10 13

(a) (i) What is the next term in the sequence?

(ii) Explain how you found your answer.

(2)

(b) What is the 8th term in the sequence?

(1)

Alexi says 34 is in the sequence.

(c) Is Alexi correct? You must give a reason for your answer.

(1)

Q15. Gemma has the same number of sweets as Betty.

Gemma gives 24 of her sweets to Betty.
Betty now has 5 times as many sweets as Gemma.

Work out the total number of sweets that Gemma and Betty have.

(4)

Q16. Denzil has a 4-sided spinner. The sides of the spinner are numbered 1, 2, 3 and 4
The spinner is biased.

The table shows each of the probabilities that the spinner will land on 1, on 3 and on 4
The probability that the spinner will land on 3 is x.

Number	1	2	3	4
Probability	0.3		x	0.1

(a) Find an expression, in terms of x, for the probability that the spinner will land on 2.
Give your answer in its simplest form.

(2)

(b) Write down the probability that the spinner will land on either 1 or 4

(1)

Denzil spins the spinner 300 times.

(c) Write down an expression, in terms of x, for the number of times the spinner is likely to land on 3

(1)

Q17. There are

x stamps in a small packet
$(x + 3)$ stamps in a medium packet
and $(x + 4)$ stamps in a large packet

The total number of stamps in the three packets is N.

(i) Write down an equation for N in terms of x. Give your equation in its simplest form.

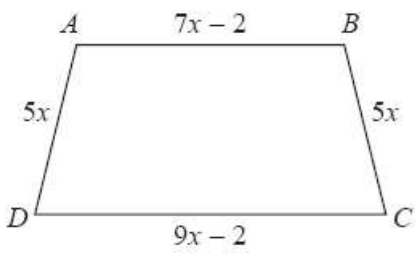
There is a total of 61 stamps.

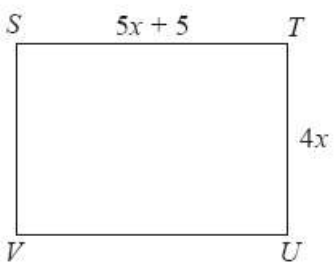
(ii) Work out the number of stamps in the medium packet.

(5)

Q18. *ABCD* is a trapezium. *STUV* is a rectangle.

Diagram **NOT** accurately drawn





All measurements are in centimetres.

The two shapes have the same perimeter.

Work out the length of *ST*.

(5)

Q19. Here are the first 6 terms of a number sequence.

5 9 13 17 21 25

(a) Write down the next term of the sequence.

(1)

(b) (i) Work out the eleventh term of the sequence.

(ii) Explain how you found your answer.

(2)

Q20. Work out the total cost of 1 kg of potatoes and 1 kg of carrots.

3 kg of potatoes and 4 kg of carrots have a total cost of 440p.
4 kg of potatoes and 3 kg of carrots have a total cost of 470p.

(4)

Q21. The Singh family and the Peterson family go to the cinema.

The Singh family buy 2 adult tickets and 3 child tickets.
They pay £28.20 for the tickets.

The Peterson family buy 3 adult tickets and 5 child tickets.
They pay £44.75 for the tickets.

Find the cost of each adult ticket and each child ticket.

(5)