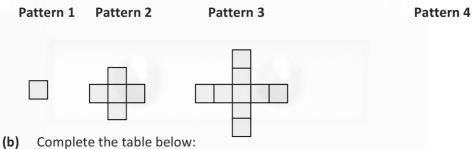
Name:	 	 	
4			

The diagram below shows the first 3 patterns in a sequence of patterns of squares.

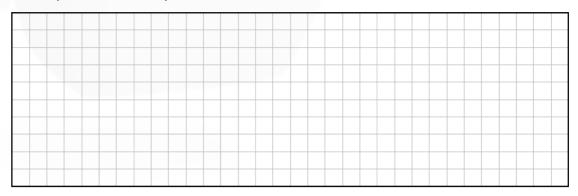
Draw pattern 4 of the sequence in the space below.



	Number of Squares
Pattern 1	1
Pattern 2	5
Pattern 3	
Pattern 4	
Pattern 5	
Pattern 6	

How many squares are there in pattern 9?

Which pattern has 101 squares?

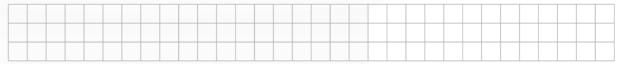


Question 7 (25 marks)

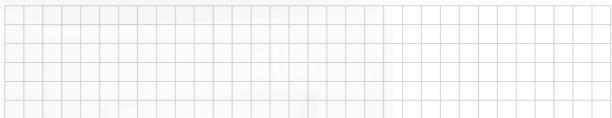
(a) Write the following numbers in order, starting with the smallest: 73%, $\frac{3}{4}$, 0.7, $\frac{4}{5}$.



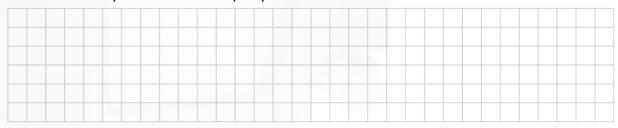
(b) (i) The population of India is estimated to be about 1 343 000 000 people. Write this number in the form $a \times 10^n$, where $1 \le a < 10$ and $n \in \mathbb{Z}$.



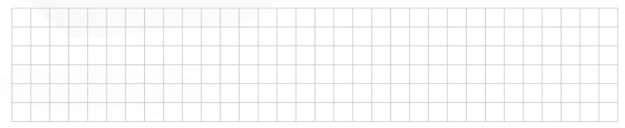
(ii) Mary is taking a trip to India and is texting a friend about the population of that country. Write the number 1343 000 000 in words.



(c) (i) There are 60 people at a party. The ratio of adults to children is 1:5. How many adults are at the party?



(ii) 8 more adults join the party and none of the children leave. What is the ratio of adults to children now?



(b) Which number in the list below does **not** have the same value as the other three numbers? Give a reason for your answer.

0.25

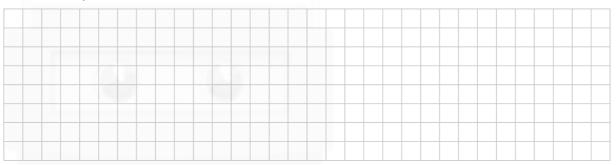
 $\frac{1}{4}$

2.5

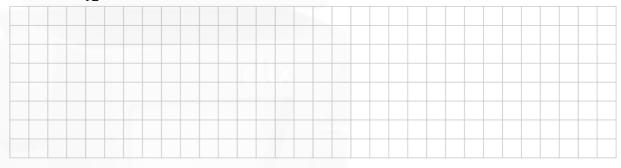
25%

Answer:										
Reason:										

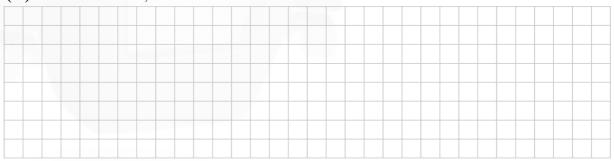
- (a) Use your calculator to answer the following.
 - (i) Find $\sqrt{3\times10^5}$, correct to the nearest whole number.



(ii) Find $\frac{\pi}{12}$, correct to one decimal place.

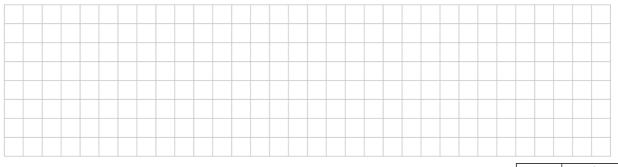


(iii) Find 8% of 910, correct to the nearest whole number.

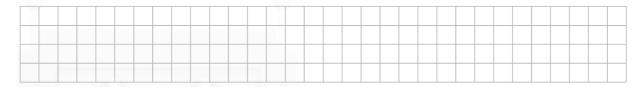


(b) The population of China is 1.351×10^9 people.

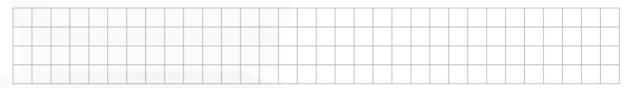
Write this as a whole number of people.



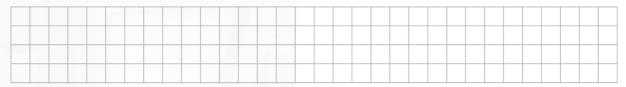
(a) (i) Write 125 as 5^n , where $n \in \mathbb{N}$.



(ii) Find $49^{\frac{1}{2}}$.

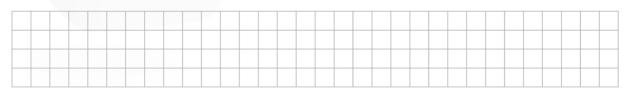


(b) Simplify $\frac{(a^4)^2}{a^5}$.



(c) For each of the following sequences of numbers, use the pattern to continue the sequence for two more terms:

(i) 2, 6, 18, 54, ____, ____



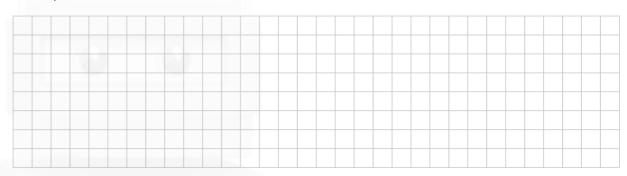
(ii) 1, 3, 6, 10, _____, ____.



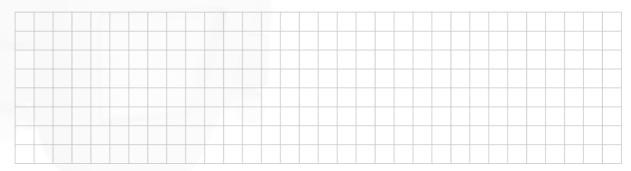
																I							
(i)	2 na	atura	l nu	mbei	`S										and								
(ii)	2 n	egati	ve ii	ntege	ers										and								
(iii)	2 p	rime	nun	bers							1				and								
A tra	ector	depr	ecia	tes ii	ı va	lue	at a	rate	of	15%	% p	er y	ear.										
(i)	Wr	ite 15	5% a	is a c	lecii	nal.																	
(ii)	The	e trac	tor v	was l	ooug	ght	for €	E100	00	0.	Fine	d its	val	ue a	it th	e en	d of	f th	ree	ye	ars		
(ii)	The	e trac	tor v	was l	ooug	ght	for €	€100	000	0.	Fine	d its	val	ue a	at th	e en	d of	f th	ree	ye	ars	•	
(ii)	The	e trac	tor v	was l	ooug	ght t	for €	£100	000	0.	Fine	d its	val	ue a	at th	e en	d of	f th	ree	ye	ars	•	
(ii)	The	e trac	tor v	was l	poug	ght t	for (£100	000	0.	Fine	d its	val	ue a	at th	e en	d of	fth	ree	ye	ars	•	
(ii)	The	e trac	tor v	was l	ooug	ght t	for (£100	000	0.	Fine	dits	val	ue a	nt th	e en	d of	fth	ree	ye	ars	•	
(ii)	The	e trac	torv	was t	poug	ght i	for €	£100	000	0.	Fine	d its	val	ue a	at th	e en	d of	fth	ree	ye	ars	•	
(ii)	The	e trac	tory	was l	ooug	ght	for (E100	000	0.	Fine	dits	val	ue a	nt th	e en	d of	f th	ree	ye	ars	•	
(ii)	The	e trac	torv	was l	ooug	ght t	for (£100)00	0.	Fine	d its	val	ue a	nt th	e en	d of	fth	ree	ye	ars		
(ii)	The	e trac	torv	was t	pooug	ght i	for €	E100	000	0.	Fino	d its	val	ue a	nt th	e en	d of	fth	ree	ye	ars		
(ii)	The	e trac	torv	was t	pooug	ght 1	for (2100	000	0.	Fino	d its	val	ue a	at th	e en	d of	fth	ree	ye	ars		
(ii)	The	e trac	torv	was t	poone	ght i	for (E100	000	0.	Find	d its	val	ue a	at th	e en	d of	fth	ree	ye	ars		
(ii)	The	e trac	torv	was t	poone	ght	for €	E100	000	0.	Find	lits	val	ue a	at th	e en	d of	fth	ree	ye	ars		
(ii)	The	e trac	torv	was t	pooug	ght i	for (E100	000	0.	Find	lits	val	ue a	at th	e en	d of	fth	ree	ye	ars		
(ii)	The	e trac	torv	was t	pooug	ght	for	E100	000	0.	Find	1 its	val	ue a	at th	e en	d of	fth	ree	ye	ars		
(ii)	The	e trac	torv	was t	poone	ght i	for (E100	000	0.	Find	l its	val	ue a	at th	e en	dof	fth	ree	ye	ars		
(ii)	The	e trac	torv	was t	pooug	ght	for	E100	000	0.	Find	1 its	val	ue a	at th	e en	dof	fth	ree	ye	ars		
(ii)	The	e trac	torv	was t	poone	ght	for	E100	000	0.	Find	1 its	sval	ue a	at th	e en	dof	fth	ree	ye	ars		

Use your calculator to answer the following.

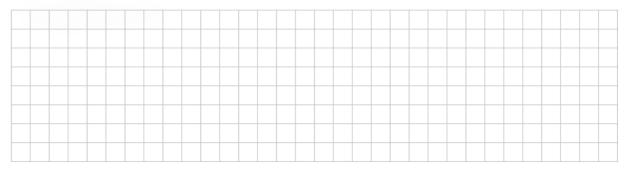
(a) Find $\sqrt[3]{264 \cdot 3}$, correct to two decimal places.



(b) Find the exact value of $\frac{1}{(0.5)^2} - (1.2)^3$.



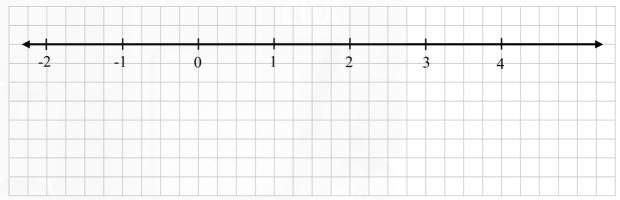
(c) Write down the whole number closest to the value of $\sqrt{70} \times \tan 56^{\circ}$.



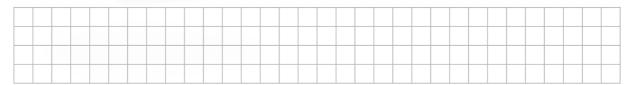
- (a) The table below shows a list of numbers and a list of sets that a number could be an element of.
 - (i) Tick each box opposite the number if the number belongs to that set.

Number	Natural numbers N	Integers Z	Rational numbers Q	Real numbers R
3				
-2		7/05		
-0.5				
$\sqrt{2}$				
$2\frac{2}{3}$				
sin 30°				
π				

(ii) Mark each of the numbers in the table above on the number line below and label each number clearly.



- **(b)** The average distance from the earth to the moon is 3.84×10^5 km.
 - (i) Write this distance as a whole number of kilometres.



(ii) It took Apollo astronauts 3 days and 4 hours to travel to the moon from earth. Find their average speed in km per hour.

