



1) Copy and complete the following table. (5)

Number	N	N <sub>0</sub>	Z	Q	Q'
$\sqrt{3}$					
-2					
$\sqrt{25}$					
250,3					
1,3̇					

[5]

2) Calculate the following WITHOUT the use of a calculator:

- 2.1)  $-2 \times (-3)$  (1)  
 2.2)  $(6)(-3) + (-1)$  (2)  
 2.3)  $-1 - (-20)$  (2)  
 2.4)  $\frac{-2(3-4)}{4+2 \times (-2)}$  (3)  
 2.5)  $\frac{(10)(-2)}{5} + 25$  (3)

[11]

3) Evaluate the following WITHOUT the use of a calculator:

- 3.1)  $3^2$  (1)  
 3.2)  $-2^2$  (1)  
 3.3)  $(-3)^2$  (1)  
 3.4)  $\sqrt{81}$  (1)  
 3.5)  $-\sqrt{16} + \sqrt[3]{(-27)}$  (2)

[6]

4) Answer the following question WITHOUT the use of a calculator:

- 4.1) Write 484 as a product of its prime factors. (2)  
 4.2) Use your answer to find the square root of 484. (show your working) (2)

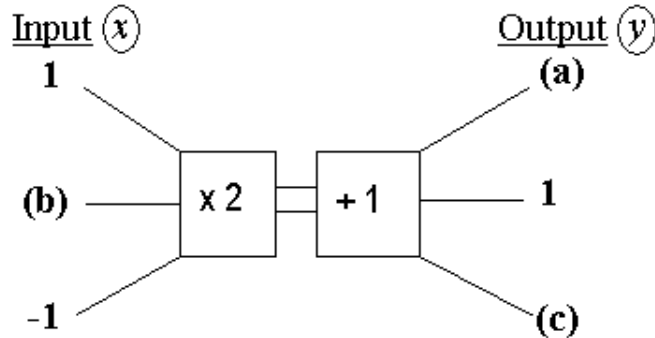
[4]

5) Extend the following number patterns by giving the next two numbers:

- 5.1) 1; 8; 27; 64; \_\_\_\_\_; \_\_\_\_\_ (2)  
 5.2) 12; 7; 2; -3; \_\_\_\_\_; \_\_\_\_\_ (2)

[4]

- 6.1) Consider the flow diagram below and give the missing input and output values for (a); (b) and (c):



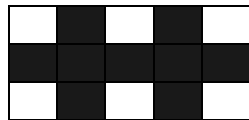
- 6.2) Write down an equation that gives the relationship (in terms of  $x$  and  $y$ ) between the input and output values above. (3)  
 (2)  
 [5]

- 7.1) Give an algebraic expression for each of the following (use  $x$  as the variable):  
 7.1.1) The sum of a number and 4. (1)  
 7.1.2) Twice the difference between a number and 3. (2)  
 7.2) Simplify the following algebraic expressions:  
 7.2.1)  $a + 3a - 2a$  (1)  
 7.2.2)  $x \times (5 - 2) \times y$  (2)  
 [6]

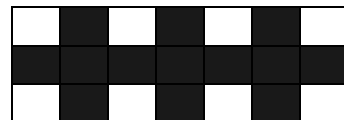
- 8) Study the patterns below and answer the questions that follow:



Pattern 1



Pattern 2



Pattern 3

- 8.1) Copy and complete the following table. (2)

<b>Pattern number (p)</b>	1	2	3	
<b>White Blocks (w)</b>	4	6		32

- 8.2) Write down a mathematical formula to represent the relationship between the the number of white blocks ( $w$ ) and the pattern number ( $p$ ).  
 (Give your answer in the form  $w = \dots$ ) (2)  
 8.3) Which variable is the independent variable? (1)  
 8.4) Which variable is the dependent variable? (1)  
 [6]

- 9) A farmer has 3 hens. If each hen lays two eggs every three days, how long will it take to produce a dozen eggs? (note: There are 12 eggs in a dozen) [3]

**{TOTAL: 50 MARKS}**