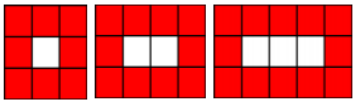
Question 2. The first three stages of a pattern are shown below. Each stage is made up of a certain number of white tiles and a certain number of shaded tiles.



Assuming the pattern continues:

Write down the relationship (using words or symbols) between the number of white tiles and the number of shaded tiles in any stage of the pattern. State clearly the meaning of any symbols where used.

Question 5. Apples cost a cents each. Bananas cost b cents each.

If I buy 3 apples and 2 bananas, what does $3a + 2b$ represent?

(a) 3 apples and 2 bananas (b) The total amount of fruit I buy (c) The total cost of 3 apples and 2 bananas

Question 20. In a hospital, there are 5 times as many nurses as doctors. If we let n equal the number of nurses and d equal the number of doctors, which one of the following is correct?

(a) $5n = d$ (b) $\frac{n}{d} = 5$ (c) $\frac{d}{n} = \frac{5}{1}$ (d) $n = 5 + d$

Maths Competency Test available at: www.projectmaths.ie

(c) Niamh is in a clothes shop and has a voucher which she **must** use. The voucher gives a €10 reduction when more than €35 is spent. She also has €50 cash. Write down an inequality in x to show the range of money she could spend in the shop.

$\square \leq x \leq \square$

Write down an inequality in y to show the price range of articles she could buy.

$\square \leq y \leq \square$

Junior Certificate 2012 – sample paper

- make use of letter symbols for numeric quantities
- emphasise relationship-based algebra
- connect graphical and symbolic representations of algebraic concepts
- use real life problems as vehicles to motivate the use of algebra and algebraic thinking
- use appropriate graphing technologies (calculators, computer software) throughout the strand activities

NCCA, JC Syllabus, p.26

NCCA, LC Syllabus, p.35

2015, JCOL, Paper 1 Question 9

Factorise fully each of the following.

(a) $7x - 21y$

(b) $x^2 - 25$

(c) $x^2 - x - 6$

2015 JCOL, Paper 1 Question 11

(a) Solve the equation $5x - 10 = 3x + 2$.

(b) John says that $x = 4$ is a solution of $x^2 - 2x - 8 = 0$. **Show** that John is correct.

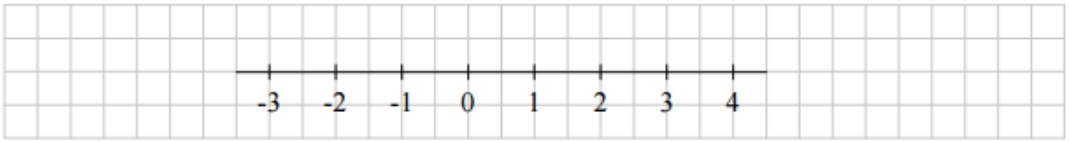
(c) Solve the simultaneous equations:

$$x + y = 11$$
$$x - y = -5.$$

2015, JCOL, Paper 1 Question 7

(a) Graph the following inequality on the number line below.

$$x \leq 2, \quad x \in \mathbb{R}$$



Looking for Patterns: T&L Integers www.projectmaths.ie

Table 1		
3 Times	Result	
3 × 4	= 12	Positive Answer
3 × 3	= 9	Positive Answer
3 × 2	=	
3 × 1	=	
3 × 0	= 0	0
3 × (-1)	=	
3 × (-2)	=	
3 × (-3)	=	
3 × (-4)	=	
3 × (-5)	=	

Table 2		
5 Times	Result	
5 × 4	= 20	Positive Answer
5 × 3	= 15	Positive Answer
5 × 2	=	
5 × 1	=	
5 × 0	= 0	0
5 × (-1)	=	
5 × (-2)	=	
5 × (-3)	=	
5 × (-4)	=	
5 × (-5)	=	

Table 3		
-2 Times	Result	
-2 × 4	= -8	Negative Answer
-2 × 3	= -6	Negative Answer
-2 × 2	= -4	
-2 × 1	=	
-2 × 0	= 0	0
-2 × (-1)	=	
-2 × (-2)	=	
-2 × (-3)	=	
-2 × (-4)	=	
-2 × (-5)	=	

Table 4		
-4 Times	Result	
-4 × 4	= -16	Negative Answer
-4 × 3	= -12	Negative Answer
-4 × 2	= -8	
-4 × 1	=	
-4 × 0	= 0	0
-4 × (-1)	=	
-4 × (-2)	=	
-4 × (-3)	=	
-4 × (-4)	=	
-4 × (-5)	=	

Multiple Procedures and Solution Methods/Explanations

$s = 6 + 2w$

$s = 8 + 2(w - 1)$

$s = 3(w + 2) - w$

$s = 2(w + 2) + 2$

Where s= number of shaded tiles and w=number of white tiles.