Algebra Diagnostic test

1.Write down the next 3 terms and the rule for each sequence:

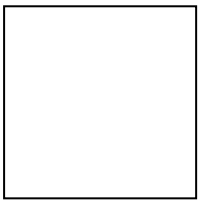
a) 5, 8, 11, 14……..
b) 0, 3, 8, 15, ..
c) 3, 9, 27, 81……

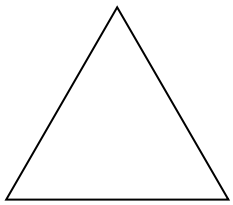
2. Draw the graph of $y = x^2 + x$, filling in the table of values to establish points:

x	- 3	-2	-1	0	1	2	3
y	6				2		

Use your graph to find solutions to $x^2 + x = 0.5$

3.





The square has sides of length x and the triangle has height 8cm and base length 4cm. They both have the same area.
a) Make an equation in x.
b) Solve the equation to find x

4. multiply out

a) 7 (3x + 5)
b) (x + 5)(x – 3)
c) $(x – 6)^2$

b) $4x^2 - 12x$
c) $x^2 + 6x + 8$
d) $x^2 - 36$

6. Simplify:

a) 4a + 8b – 5a + 12b
b) 2a × a × 4a × a
c) $27^{1/3}$

7. If a =4, b= -2 and c = 10 find the value of:

i) ab= ii) a+b iii) $c\sqrt{a}$
iv) $a^{0} =$ v) b^{-1}

8. Solve:

$x^2 - 3x – 4 = 0$

9. Solve the equations:

a) 5x – 4 = 21
b) 2x + 1 = 3x –2
c) 10 – 4x = 8
d) $\frac{3}{x} = 12$

10. Solve the simultaneous equations:

$3x – 2y = 8$
$x + 4y = 5$

11. On axes shade the area for which $y+x > 7$ and $x < 2$.

12. $x^3 + 1 = 30$ has a solution between x=3 and x = 4. Find the solution to 1d.p.

5. Factorise:

a) 3x + 15

12. Solve the equation

$2x^2 + 6x – 10 = 0$

13. Make a the subject:

a) 3a-2b = 7
b) $4a^2$ b - 2 = c
c) $\frac{5}{\sqrt{a}}$ **= b**

14. Simplify:

$$\frac{6x+9}{4x^2-9}$$

15. Sketch the graph of $y=x^3$
Hence or otherwise sketch the graph of $y=(x-3)^3$.