**ALGEBRA ASSESSMENT.**

***1.(a) Simplify fully: (x2 – x – 12)***

***(x2 – 16)***

***(b) Expand and simplify: (2x – 5)(x + 2)(x – 3)***

***(c) Factorise fully:***

***(i) 3x2 – 3x – 6***

***(ii) 3x2 – 11x – 4***

***(d) (i) Change this equation into the form ax2 + bx + c = 0***

***(x – 2)(x + 1) = 2x + 5***

***(ii) Solve the equation in (i) using the quadratic formula***

***and give your answer to 3 sig fig.***

***(e) The equation 2x2 + 3x – (k + 2) = 0 has only one real solution. Find k.***

***(f) (i) Express px2 – 4x + p = x2 – 1 in the form ax2 + bx + c = 0***

***(ii) Find the possible values of p so that the equation in (i) has real***

***solutions.***

***2.(a) Solve for x: 4(3x – 2) = 6 – x***

***(b) Solve for x: (x – 1)2 – 2(x + 2) + 7 = 0***

***(c) Solve for x: 3x2 = x + 2***

***(d) The area of the outside of a cone is given by A = πRL***

***where R is the radius of the base and L is the slant height.***

***If L = R – 2 and the area is 24π, find the values of R and L.***

***(e) Solve the equation: 1 + 1 = 13***

***x (x + 3) 40***

***3. (a) Factorise 7x2 – 4x +3***

***(b) Solve 7x2 – 4x +3 = 0***

***(c) Find the EXACT solution of the equation:***

***x2 – 8x = 5 in the form d ± √p using the quadratic formula or by***

***completing the square method***

***(d) Find what the value of k must be: x2 – 5x + k = x – 3***

***x2 – 6x + 8 x – 4***

***(e) Bob tries to solve the equation: x2 – 2x – 24 = 3***

***x2 – 6x***

***This is his working:***

***x2 – 2x – 24 = 3x2 – 18x line 1***

***0 = 2x2 – 16x + 24 line 2***

***0 = 2(x2 – 8x + 12) line 3***

***0 = 2(x – 3)(x – 4) line 4***

***x = – 3 or – 4 line 5***

***(i) Find which lines Bob has made mistakes.***

***(ii) Explain what the mistakes are.***

***(iii) Suggest another way he could have solved the equation.***

***(f)***

***A B This building has a parabolic***

***cross section with the top chopped off.***

***The distance AB is 20 metres.***

***The distance PQ is 40 metres.***

***The height of AB above the ground PQ***

***is 60 metres.***

***P Q***

***Find the equation of this parabolic cross section and find how high it would have been if the top were not chopped off.***