Algebra 1 – Practice Exam

Q1) Determine what type each of the following numbers are. Note that some numbers could fall into more than one category.

a) 51

b) 6.23

c) 4π

d) $\frac{6}{13}$

e) $\sqrt{7}$

f) $\frac{1}{\sqrt{3}}$

Q2) a) Express $\sqrt{20} + 2\sqrt{45} - \sqrt{80}$ as a surd in its simplest form.

b) Evaluate $\sqrt{27}\ x\ \sqrt{3}$.

c) Express $\frac{4}{\sqrt{8}}$ with a rational denominator in its simplest form.

Q3) a) Evaluate $\frac{a^2\ x\ a^3}{(2a^3)^2}$

b) Evaluate $16^{\frac{3}{4}}$

Q4) Change the subject of the formula to a.

a) $3a^2 + r = s$

b) $x(a - 1) = b(a + 2)$

Q5) Expand the brackets and simplify the expression $x(x + 4) - x(2x - 3)$.

Q6) Factorise the expression.

a) $20x + 4xy$

b) $4x^2 - 64$

c) $x^2 - 8x + 15$

d) $x^2 - x - 20$

Q7) Write $x^2 - 16x + 2$ in the form $(x + a)^2 + b$.

Q8) Express $\frac{5}{(x-3)} - \frac{1}{(x+1)}$ as a single fraction.

Q9) Simplify $\frac{t^2 - 2t}{t^2 + t - 6}$ fully.

Q10) Solve the following.

a) $3r - 7(1 + r) = 12$

b) $11 - 2(4 + 3x) < 39$

Q11) Solve the following system of equations.

$-3x + 2y = 5$

$4x + 3y = -1$

Q12) A sequence is generated by the following rule, $x_n = 4n - 2$.

Determine the 15th and 20th terms of this sequence.

Q13) If 3, x, and 9 are the first three terms of a geometric sequence, find:

a) The exact value of x.

b) The exact value of the 4th term.

Q14) Work out the equation of the straight line passing through $(2, -3)$ & $(4, -2)$.

Q15) Sketch the line with equation $y = 2x + 3$.

Q16) For the function $f(x) = 2x^3 - 4$ create a table of input / output values.

Plot these co-ordinates on an $x - y$ axis and make a sketch of the graph.

Q17) What is the average rate of change of the function $f(x) = x^2 - 2$ on the interval $-6 \leq x \leq -2$.

Q18) Solve the following equation writing your answers to 2 decimal places.

$3x^2 - 4x - 5 = 0$

Q19) Determine the nature of the roots of the quadratic equation $2x^2 - 4x - 6 = 0$

Q20) Find the equation of the axis of symmetry of $y = x^2 + 10x + 6$. Also, state the co-ordinates of the point where the graph crosses the y-axis.