Test 1:   Algebra 1
Time: 1 hour   **Marks: 50**

Question 1

1.1   Consider: A= $\sqrt{\dfrac{9}{11-x}}$

If $x \in \{-14\,;\,-11\,;\,-5\,;\,0\,;\,5\,;\,11\,;\,14\}$, which value(s) of x will make
A:

1.1.1   Rational   (1)

1.1.2   Irrational   (1)

1.1.3   Undefined   (1)

1.1.4   Non-real   (1)

                                                                                                        [4]

 Question 2

2.1   Calculate the following products:
2.1.1 $\left(3x^2 - 5y\right)^2$ (4)
2.1.2 $\left(2-b\right)\left(3+a\right)$ (4)
2.1.3 $\left(p-2\right)\left(p^2 + 2p + 4\right)$ (4)

2.2   Factorise fully:
2.2.1 $2x^4 - 32$ (4)
2.2.2 $2m^2 - 5m + 3$ (4)
2.2.3 $x^3 - y^3 - 2x + 2y$ (4)
                                                                                                        [24]

Question 3

3.1   What must be added to $x^2 - x + 4$ to make it equal to $(x+2)^2$ (3)
3.2   With what expression must $27x^3 + 1$ be divided to get a quotient of $3x + 1$ (3)
3.3   Evaluate $\dfrac{x^3+1}{x^2-x+1}$ if $x = 7,85$ without using a calculator. Show all your work.   (4)
3.4   With what expression must $(a - 2b)$ be multiplied to get a product of $a^3 - 8b^3$ (3)
                                                                                                        [13]

Question 4

Simplify the following algebraic fractions

4.1 $\dfrac{x}{x+y} + \dfrac{x^2}{y^2-x^2}$ (4)

4.2 $\dfrac{x^3+1}{x^2-x-2} \times \dfrac{x^2-4x+4}{x^2-x+1}$ (5)