A level Mathematics Summer Practice

1) a) Simplify as far as possible $(3x – 1) – 2(x – 5)$ (2)

b) Expand $(x – 3)(x^2 + 5x – 2)$ (2)

2) Factorise the following expressions

a) $x^2 + 8x$ (1)

b) $x^2 + 8x + 15$ (2)

c) $x^2 – 3x – 10$ (2)

d) $x^2 – 4y^2$ (1)

e) $6x^2 + 7x + 2$ (2)

3) Solve

a) $4x + 2 = 2x + 12$ (2)

b) $6(x – 1) – 6(1 – 3x) = 36$ (3)

c) $3(3x – 2) – 2(x + 4) = 2x + 1$ (3)

4) Solve

a) Factorise and hence solve $x^2 + 5x + 4 = 0$ (2)

b) Solve by completing the square $x^2 + 4x – 13 = 0$ (2)

c) Use the quadratic formula to solve $x^2 + 5x – 7 = 0$ giving your answers in surd form (3)

d) $2x^2 – 4x + 1 = 0$ (3)

5) Solve the simultaneous equations

a) $5x + 3y = 21$ and $2x + y = 8$ (4)

b) $x + xy + 2y^2 = 11$ and $y + x = 3$ (4)

6) Expand and simplify

a) $\sqrt{5}(\sqrt{3} + 1)$ (1)

b) $(4\sqrt{5} - 1)(3\sqrt{5} - 7)$ (2)

7) Rationalise the denominator

a) $\frac{5}{\sqrt{7}}$ b) $\frac{3}{2\sqrt{5}+3}$ c) $\frac{2\sqrt{7}}{\sqrt{7}+1}$ (5)

8) Evaluate showing your working

a) 4^3 b) $4^3 – 4^2$

c) $8^{2/3}$ d) $64^{-⅓}$ (4)