Further Maths: REVISION

Coordinate Geometry

1) A line segment joins the points A(-1,5) and B(7,3). Find
      a) the length of the line AB, giving an exact (surd) answer
      b) the coordinates of the midpoint of the line AB
      c) the gradient of the line AB
      d) the gradient of any line perpendicular to the line AB

2) The line y = mx+c passes through the point (3,4). It is parallel to the line y = 2x+1.
      Work out the values of m and c.

Number: Ratio & Percentages

3) The ratio of a : b is 5 : 4
      a) write a in terms of b
      b) work out 3a + b : b, giving your answer in its simplest form
4) An item costs £250. Answer each of the following, separate questions
      a) Find its value after 8 years if it depreciates by 10% a year.
      b) Calculate its original value if £250 is a 20% decrease from its original value.
      c) It is sold for £260. Calculate the % profit made on this sale.
5) Write the recurring decimal 0.141414... as a fraction

Algebraic Fractions & Surds

6) Simplify:
      a) $\sqrt{48}$
      b) $\sqrt{48} + 2\sqrt{3}$
      c) $(2 + \sqrt{3})(5 - \sqrt{3})$
7) Simplify:
      a) $\dfrac{4x^3y^2}{20x^2y^4}$
      b) $\dfrac{x^2-9}{x+3}$
      c) $\dfrac{5}{x+2} + \dfrac{3}{2x}$, expressing as a single fraction
      d) $\dfrac{3}{4x} \times \dfrac{2x^3}{9}$, expressing as a single fraction
      e) $\dfrac{8}{5x} \div \dfrac{x^3}{15}$, expressing as a single fraction

Algebraic Sequences

8) Find the nth term of the sequences:

      a) 2, 10, 18, 26, 34….

      b) 2, 10, 22, 38, 58….

9) The nth term of a sequence is $\dfrac{2n-1}{n+3}$

      a) Work out the position of the term that has value 1.72

      b) Find the limiting value of the sequence as $n \to \infty$.

      Show your working.

Algebraic Inequalities

10) Work out the largest integer value of x that satisfies $10 - 3x > 2$

11) Given $-4 < p < 2$ and $3 < q < 6$, write an inequality for:

      a) $p - q$

      b) pq

12) Solve the inequality $x^2 - 3x - 4 \leq 0$

Algebraic Expressions & Equations

13) Make x the subject of the formula $y = \dfrac{2+x}{3-x}$

14) Expand the brackets $(x+3)(x-2)(2x+1)$

15) Solve the following pairs of simultaneous equations:

      a) $3x + 4y = 10$
               $2x + 5y = 23$

      b) $y - x = 1$
               $x^2 + y^2 = 5$

Trigonometry

16) Find the area of these triangles:

a)

6.2cm

71°   4.7cm

b)

10.2cm

76°