Coimisiún na Scrúduithe Stáit
State Examinations Commission

LEAVING CERTIFICATE EXAMINATION, 2008

MATHEMATICS – FOUNDATION LEVEL

PAPER 1 (300 marks)

FRIDAY, 6th JUNE − MORNING 9:30 to 12:00

Attempt **QUESTION 1** (100 marks) and **FOUR** other questions (50 marks each).

WARNING: **Marks will be lost if all necessary work is not clearly shown.**

Answers should include the appropriate units of measurement, where relevant.

1. **(i)** Find $\sqrt{87\cdot32}$, correct to two decimal places.

(ii) Find the exact value of $(4\cdot2)^2 - (3\cdot6)^2$.

(iii) Find $(3\cdot1)^2 - \dfrac{1}{(3\cdot1)}$, correct to one decimal place.

(iv) Find the exact value of $17\cdot2 - 6\cdot4 \times 2\cdot81$.

(v) A cinema has 500 seats. One night 200 seats were empty.
What percentage of the seats were occupied?

(vi) Given an exchange rate of €1 = 9·272 Swedish Kronor,
find the value in euro of 700 Swedish Kronor.

(vii) A prize of €300 is divided between 1st and 2nd place in the ratio of 3:2.
How much does each person get?

(viii) Find the exact value of $\dfrac{167\cdot3}{\sqrt{12\cdot25}}$.

(ix) Find $\dfrac{(5\cdot78\times10^9) - (3\cdot46\times10^5)}{4\cdot32\times10^4}$, correct to three significant figures.

(x) Find $\dfrac{47\cdot3 - 8\cdot9}{3\cdot25\times1\cdot47}$, correct to two decimal places.

2. **(a)** **(i)** Change 750 cm to metres.
  (ii) Change 2·56 kg to grams.

(b) The charges for Helen's bill-pay phone per month are as follows:

  Fixed charge: €10
  Call charges:
    First 40 minutes: 25 cent per minute
    Additional minutes: 15 cent per minute
  Text messages: 12 cent each

During March, Helen used 60 minutes call time and sent 30 text messages.

  (i) Calculate the total charge for all her phone calls.

  (ii) Calculate the charge for her text messages.

  (iii) Calculate Helen's bill, after VAT at 21% is added to all the above charges.
  Give your answer correct to the nearest cent.

(c) John earns €11 per hour and works a 40 hour week. His rate of tax is 20% and he has tax credits of €50 per week.

  (i) Calculate the tax payable by John.

  (ii) John also pays PRSI at the rate of 4% of his gross weekly wage.
  Calculate John's weekly take-home pay.

3. **(a)** The estimated building cost of a community hall was €600 000.
  The actual cost was €750 000.

  (i) Find the error in the estimate.

  (ii) Find the percentage error.

(b) €4000 is invested for three years at the rate of 2·5% per annum compound interest.
  Find the value of the investment at the end of the three years, correct to the nearest cent.

(c) The value of a computer depreciates at the rate of 20% per year.
  At the end of the first year a computer is worth €656.

  (i) Find the value of the computer when it was new.

  (ii) What will the computer be worth at the end of the third year?
  Give your answer to the nearest euro.
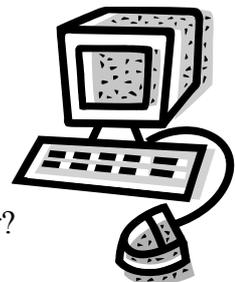
4. **(a)** Solve for x: $5x - 2 = 3x + 14$.

(b) Solve the simultaneous equations

$$3x - 4y = 8$$
$$x + 2y = 16.$$

(c) Alan Barry and Colm each bought a ticket for a concert.
Barry paid €5 more than Alan for his ticket.
Colm paid twice as much as Barry.
Alan's ticket cost € x.

   (i) Write an expression in x for the price that Barry paid.

   (ii) Write an expression in x for the price that Colm paid.

   (iii) Given that the total paid out by the three friends was €95,
how much did Alan pay?

5. **(a)** **(i)** List the first five multiples of 3 and list the first five multiples of 4.

   (ii) Hence, or otherwise, write down the lowest common multiple of 3 and 4.

(b) **(i)** Solve the quadratic equation $x^2 + 4x + 3 = 0$.

   **(ii)** Solve the quadratic equation $2x^2 - 9x + 6 = 0$, correct to two decimal places.

(c) **(i)** Solve $3x - 2 \leq 17, \quad x \in \mathbf{N}$.

   (ii) Solve $5 - 2x \leq 1, \quad x \in \mathbf{N}$.

   (iii) Write down the values of x which satisfy both of the above inequalities.

6. A student spends her free time at home watching television and listening to music. The following chart shows the amount of time spent in minutes by this student doing these activities in one particular week.

For example, on Friday, she spent 50 minutes watching television and 30 minutes listening to music.
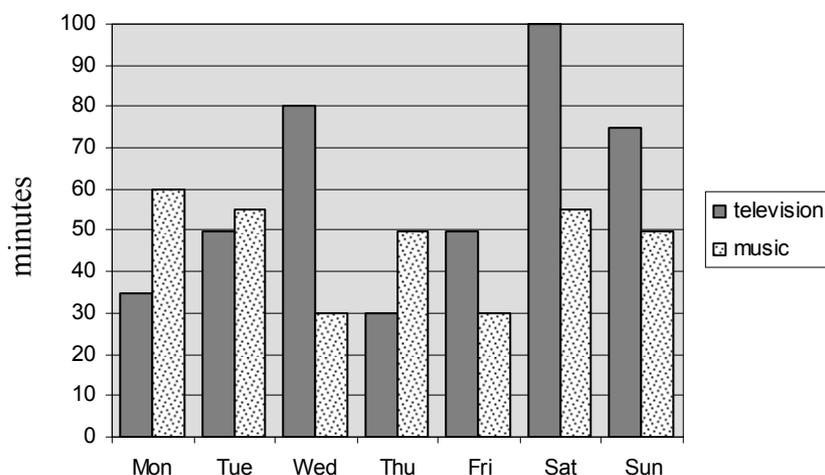
(i) On what day did she spend the least amount of time watching television?

(ii) Which day shows the greatest difference between time spent watching television and time spent listening to music?

(iii) On which days did she spend more than two hours in total watching television and listening to music?

(iv) What is the average time per day she spent watching television during that week?

(v) During that week, how much more of her free time did she spend watching television than listening to music?

7. Draw the graph of the function

$$f : x \rightarrow 2x^2 - 3x - 5, \text{ for } -2 \le x \le 3, x \in \mathbf{R}.$$

Use your graph to estimate

(i) the minimum value of $f(x)$

(ii) the value of $f(-0.5)$

(iii) the roots of $f(x) = 0$

(iv) the range of values of x for which $f(x)$ is decreasing.

FORMULAE FOR PAPER 1

Compound Interest and Depreciation:

$$A = P\left(1 \pm \frac{r}{100}\right)^n; \qquad P = \frac{A}{\left(1 \pm \frac{r}{100}\right)^n} \ .$$

The solutions of the quadratic equation $ax^2 + bx + c = 0$ are

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$