**Coimisiún na Scrúduithe Stáit**
**State Examinations Commission**

LEAVING  CERTIFICATE  EXAMINATION, 2005

MATHEMATICS – FOUNDATION  LEVEL

PAPER 1 ( 300 marks )

THURSDAY, 9 JUNE – MORNING, 9:30 – 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 $\sqrt{87}$, correct to two decimal places.

**(ii)** Find $(2.15)^3$, correct to the nearest whole number.

**(iii)** Find the exact value of $45.5 - 3.5 \times 6.25$.

**(iv)** Find the exact value of $\dfrac{1}{0.5} - \dfrac{2}{0.625}$.

**(v)** A holiday costs €650.
The booking deposit is 15% of this cost.
Find the booking deposit.

**(vi)** Given that €1 is worth $1.25, find the value of €767, correct to the nearest dollar.

**(vii)** Express $1\dfrac{1}{2} + \dfrac{3}{13}$ as a decimal, correct to two decimal places.

**(viii)** Divide €112 in the ratio 2 : 5 : 7.

**(ix)** Find, correct to two significant figures,

$$\dfrac{34.8 \times 2.05}{46.3 - 11.7}.$$

**(x)** Find the exact value of

$$\dfrac{27.3 \times 10^5}{2.05 \times 10^6 + 0.25 \times 10^7}.$$

**2.** **(a)** A jug contains 1.5 litres of water.
Another 750 cm$^3$ of water is poured into the jug.
How much water is then in the jug? Give your answer in cm$^3$.

**(b)** Each week a person earns €510 and has Tax Credits of €56.
The rate of tax is 20%.

**(i)** Find the amount of tax paid by this person each week.

**(ii)** Find the person's weekly take-home pay.

**(c)** A train travelled 110 km in 2 hours. The train travelled the first 60 km at an average speed of 45 km per hour. It travelled the next 30 km at an average speed of 90 km per hour.

**(i)** How long did it take the train to travel the first 60 km?
Give your answer in hours and minutes.

**(ii)** Calculate the average speed of the train for the last 20 km.
Give your answer in km per hour.

**3.** **(a)** A student estimated that the time taken to go to school was 35 minutes.
The actual time taken was 38 minutes.

**(i)** Find the error in the estimate.

**(ii)** Find the percentage error, correct to two decimal places.

**(b)** A shop sells loose sweets by weight. Peter bought 250 grammes of sweets for €1.75.

**(i)** Ann bought 300 grammes of the sweets. How much did she pay?

**(ii)** Brian spent €3.15 on sweets. How many grammes did he get?

**(c)** A car was bought for €20 000. After one year it had depreciated in value to €17 000.

**(i)** What was the annual percentage rate of depreciation?

**(ii)** At this rate of depreciation, how much will the car be worth 4 years after it was bought? Give your answer correct to the nearest euro.

**4.** **(a)** Solve $4x + 3 = 18 - x$.

**(b)** Solve the simultaneous equations
$$x + 2y = -4$$
$$2x - y = 7.$$

**(c)** **(i)** Solve $2x + 1 \geq 9$.

**(ii)** Solve $3 - 4x \geq -17$.

**(iii)** Write down the whole numbers which satisfy both $2x + 1 \geq 9$ and $3 - 4x \geq -17$.

**5.** **(a)** **(i)** List all the even numbers between 9 and 21.

**(ii)** List all the prime numbers between 9 and 21.

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

**(ii)** Solve the quadratic equation $5x^2 - 11x - 3 = 0$, correct to one decimal place.

**(c)** Laura, Barry and David use their mobile phones to send text messages.
In one week they sent a total of 74 messages.

Laura sent $x$ messages.

Barry sent twice as many as Laura.

David sent 8 messages.

**(i)** Write the above information as an equation in $x$.

**(ii)** Solve the equation to find the value of $x$.

**(iii)** How many messages did Barry send?

**(iv)** Write the number of messages sent by Laura as a percentage of the total number of messages sent, correct to the nearest whole number.

**6.** A shop rents out videos and DVDs. The graph below shows the breakdown of rentals over a week.

For example, on Tuesday there were 5 video and 8 DVD rentals.
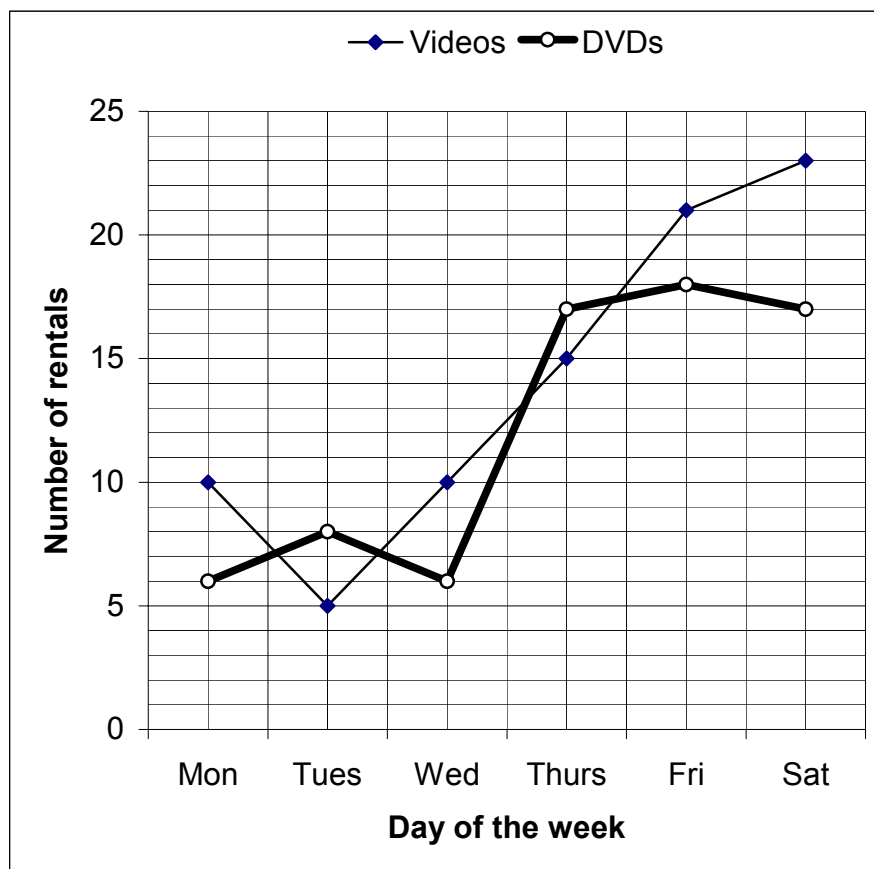


**(i)** How many videos were rented on Friday?

**(ii)** How many more videos than DVDs were rented on Wednesday?

**(iii)** On which days of the week was the number of videos rented greater than the number of DVDs rented?

**(iv)** Find the average number of videos rented per day.

**(v)** Over the six days, what percentage of rentals were DVDs?
Give your answer correct to the nearest whole number.


**7.** Draw the graph of the function
$$f : x \rightarrow 2x^2 + 3x - 4 \text{ for } -3 \le x \le 2, \ x \in \mathbf{R}.$$

Use your graph to estimate

**(i)** the roots of $f(x) = 0$

**(ii)** the minimum value of $f(x)$

**(iii)** the value of $f(1.5)$

**(iv)** the values of $x$ for which $f(x) = 1$.

# 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 to the quadratic equation $ax^2 + bx + c = 0$ are

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