AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA

LEAVING CERTIFICATE EXAMINATION, 1999   17242

MATHEMATICS - FOUNDATION LEVEL

PAPER 1 (300 marks)

THURSDAY, 10 JUNE - MORNING, 9.30 - 12.00

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

Marks may be lost if necessary work is not clearly shown.

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1. *(i)*   Find $\sqrt{67}$, correct to one decimal place.

    (ii)   Find $(3.25)^3$, correct to three significant figures.

    (iii) Find $(2.19 - 1.03 + 3.24)^2$, correct to the nearest whole number.

    (iv)   Find the value of $\dfrac{1}{(0.25)^2} + \dfrac{1}{(0.125)^2}$.

    (v)   Find 21% of IR£64.36, correct to the nearest penny.

    (vi)   If 2450 Italian Lira = IR£1, find, to the nearest IR£, the value of 458 956 Italian Lira.

    (vii) Find the total cost of
             16 bottles of lemonade at 45p each
             24 bars of chocolate at 59p each
             7 tins of biscuits at IR£5.60 each.

    (viii) Find $\dfrac{5}{13} + \dfrac{1}{7}$, correct to one decimal place.

    (ix)   Find the value of

    $$\frac{(2.58 \times 10^4) - (5.22 \times 10^2)}{(1.2 \times 10^3)}.$$

    (x)   Find, correct to two significant figures,

    $$\frac{(15.38 - 4.16)}{(6.43 \times 0.5)}.$$

OVER →

2. **(a)** Change to metres
   (i) 5.42 km
   (ii) 4325 cm.

(b) A person has a gross weekly wage of IR£250.60 and a weekly tax free allowance of IR£75.80. Calculate
   (i) the weekly taxable income
   (ii) the amount of tax paid per week if the tax rate is 25%.

(c) A coffee retailer buys
   16 kg of Kenyan coffee at IR£7.50 per kg
   and 24 kg of Brazilian coffee at IR£9.10 per kg.

Find the total cost.

The retailer mixes the 16 kg of Kenyan coffee and the 24 kg of Brazilian coffee together.
Find the cost per kg of the mixture.
Find the selling price per kg of the mixture if the retailer makes a profit of 50% on the cost per kg.

3. **(a)** The height of a tree was estimated to be 15 m. Its true height was 15.68 m. Find
   (i) the error
   (ii) the percentage error, correct to one decimal place.

(b) IR£650 was invested at the rate of 4.2% per annum compound interest.
Calculate, correct to the nearest penny, the amount at the end of three years.

(c) On a journey of 270 km, a car used 1 litre of petrol for every 15 km travelled.
Calculate the number of litres of petrol used on the journey.

If 1 litre of petrol cost 60.5p, calculate the cost of the petrol used.

On another journey the car again used 1 litre of petrol for every 15 km travelled. If the cost of the petrol remained 60.5p per litre and the petrol used on the journey cost IR£24.20, calculate the length of the journey.

4. **(a)** Solve for x

$$7x - 2 = 3x + 14.$$

(b) Solve the simultaneous equations

$$3x + 2y = 12$$
$$4x - y = 5.$$

(c) A bar of chocolate costs x pence.
A bottle of orange juice costs 5 pence more than a bar of chocolate.
Two bars of chocolate and one bottle of orange juice cost IR£2.15.

Write this information as an equation in x.

Solve for x.

5. **(a)** *(i)* Write down the whole number factors of 12.

   *(ii)* Write down the factors of 12 which are prime numbers.

  (b) Solve the quadratic equation

$$5x^2 - 7x - 2 = 0.$$

Give your answers correct to two places of decimals.

  (c) *(i)* Solve $3x - 1 \leq 8$.

      (ii) Solve $3 - 5x \leq 23$.

      (iii) Write down the positive and negative whole numbers which satisfy both $3x - 1 \leq 8$ and $3 - 5x \leq 23$.

6. The graph below shows the depth of water in a tank measured at hourly intervals from 0800 hours to 1300 hours inclusive.
The depth, in metres, is shown on the vertical axis. The time is shown on the horizontal axis.
For example, at 1000 hours the depth of water in the tank was 2 metres, while at 1200 hours the depth was 3.5 metres.

Time of the day
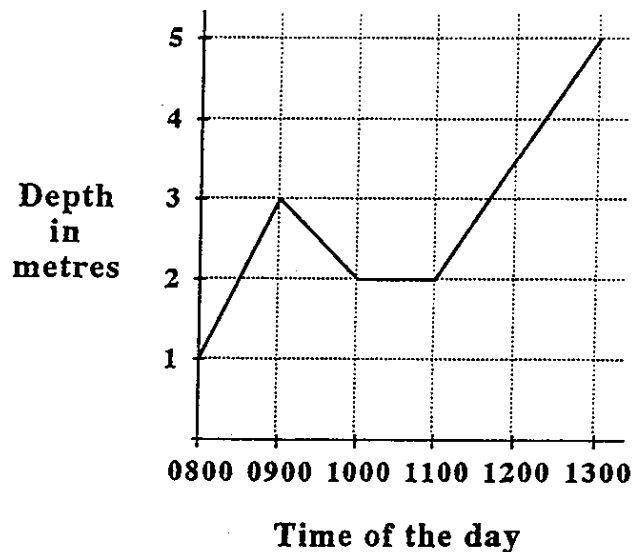
  (i) What was the depth of water in the tank at 0800 hours?

  (ii) What was the change in the depth of water between 1100 hours and 1200 hours?

  (iii) Between which hours did the depth of water not change?

  (iv) How long did it take the water to rise from 3.5 metres to 5 metres?

  (v) Calculate the average of the six measurements.

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7. Draw the graph of the function

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

Use your graph to find as accurately as possible

(i) the value of $f(1.5)$

(ii) the values of x for which $f(x) = 2$

(iii) the minimum (least) value of $f(x)$.

FORMULAE FOR PAPER 1

Compound Interest and Depreciation:

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

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

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