Pre-Leaving Certificate Applied Examination 2021

Mathematical Applications
(200 marks)

Time: 2 hours

Name:	
School:	
Address:	
Class:	
Teacher:	

General Directions

1. Complete the box above with your details.

2. Write all answers in the boxes or spaces in this answerbook.

3. Show all necessary work in the space provided.

4. Calculators may be used.

5. Answers involving money should be given correct to the nearest cent, unless otherwise indicated.

ANSWER QUESTION ONE AND THREE OTHER QUESTIONS.
ALL QUESTIONS CARRY EQUAL MARKS.

For the examiner only				
			Question	Mark
			1	
			2	
Cumulative check			3	
Running total			4	
– Disallowed			5	
= Total		↔	Total	
Total mark x 1.15 (to max. of exam. total)				

Question 1

(a) Find the value of $\sqrt{138}$, correct to 2 decimal places.

Answer:

(b) A television normally costs €185. During a sale it is **reduced** in price by 20%. Find the **sale price** of the television.

Answer:

(c) The perimeter of a triangle is 48 cm. If two sides measure 21 cm and 14 cm find the length of the third side.

Answer:

(d) Convert 23° Celsius to Fahrenheit using the formula:

$$F = C \times \frac{9}{5} + 32$$

Answer:

(e) A regular unbiased die is rolled. Find the probability of rolling a prime number.

Answer:

(f) A man runs 2.5 kilometres in 10 minutes. Calculate his speed in kilometres per hour.

Answer:

(g) Mary gets paid €15.50, €35.50 and €27 for three babysitting jobs. How much did Mary earn in **total**?

Answer:

(h) In the game of snooker, a red ball is worth 1 point, a blue ball is worth 5 points and a black ball is worth 7 points. If Jack pots 3 red balls, 1 blue ball and 2 black balls what was his **total** score?

Answer:

(i) Write the number 43,568 correct to the nearest thousand.

Answer:

(j) Find the value of X in the diagram.

73° $X°$

Answer:

Question 2: Research Element on Holiday and Travel Mathematics

The Jones family are planning a two week break in New York.

Mr. and Mrs. Jones will be travelling with their two children.

Mr. Jones is booking flights from Dublin to New York online.

(a) A return flight is priced at €395 per adult and €257 per child. Mr. Jones also adds 2 checked in pieces of luggage to his booking at a cost of €40 per piece of luggage.

Calculate the total cost of the return flights for the Jones family.

Answer:

(b) The Jones family are planning to arrive at the hotel on Monday the 2nd of October and depart on Wednesday the 18th of October. Mr Jones has decided to book **Suite** for the family. How much will the hotel bill amount to?

ROOM RATES PER NIGHT

OCTOBER 1 – 19			OCTOBER 20 – 31		
Sunday - Thursday*			Sunday - Thursday*		
HILLSIDE	LAKESIDE	SUITE	HILLSIDE	LAKESIDE	SUITE
$129	$139	$175	$79	$89	$135
Weekends*			Weekends*		
HILLSIDE	LAKESIDE	SUITE	HILLSIDE	LAKESIDE	SUITE
$139	$149	$199	$99	$109	$155

Answer:

(c) Due to their lengthy stay the hotel offer the Jones family a 10% discount on their hotel bill. How much
will their bill be after the discount?

Answer:

(d) Mr. and Mrs. Jones set out a budget of €200 per day while on their vacation. They also decide to bring an extra 20% as an emergency fund. How much will they need to save in total?

Answer:

(e) Before departing Mrs. Jones goes to the bank to convert their money into US Dollars. Given that the exchange rate on that day is €1:$1.26, how much in **dollars** will Mrs. Jones receive?

Answer:

(f) The Jones family book a Hop-on-Hop-off 48-hour bus pass for touring the city. The cost is $79.50 per adult and $65 per child. Calculate the cost of the bus passes for the family.

Answer:

Question 3

Paul works in a factory from 8:00am until 5:20pm Monday to Friday.
He takes a 20 minute break at 11:00am and 1 hour for his lunch daily.

(a) How many hours does Paul **work** from Monday to Friday?

Answer:

(b) Paul earns €14.50 per hour. If he works overtime on Saturday, he earns time and a half. What is his hourly rate on a Saturday?

Answer:

(c) During a certain week Paul works Monday to Friday and 8 hours overtime on Saturday.

    (i) Calculate his gross weekly income.

Answer:

    (ii) Pauls pays 21% tax on his **gross** earnings. Calculate his gross tax.

Answer:

    (iii) If Paul has a weekly tax credit of €42, calculate his **net** weekly income

Answer:

Question 4

Twenty members of a fitness club were tested to see how many sit-ups they could do in a minute.

The results are recorded below.

18   32   16   36   26   33   27   33   29   40
31   23   33   15   33   29   35   26   37   28

(a)   Display the data on the stem and leaf plot.

```
      |
 ─────┼──────────────────────────
  0   |
  1   |
  2   |
  3   |
  4   |
      |
 Key: |                    Answer:
```

(b)   Find the **median** number of sit-ups carried out.

Answer:

(c)   Calculate the **mean** number of sit-ups carried out by a person.

Answer:

(d) What is the **modal** number of sit-ups carried out?

Answer:

(e) What was the **range** of sit-ups carried out?

Answer:

(f) What percentage of people scored higher than the **modal** score?

Answer:

Question 5

(a) **(i)** Construct a triangle ABC in which $|AB|$ = 8 cm, $|AC|$ = 6 cm and $|\angle CAB|$ = 90°.

(ii) Measure the length of the side |BC|.

Answer:

(iii) Use the Theorem of Pythagoras, $c^2 = a^2 + b^2$ to verify your answer.

Answer:

(b) **(i)** In an election the total poll was 63,545. The number of spoiled votes was 902. Calculate the valid poll.

Answer:

(ii) In the election 6 seats have to be filled. Calculate the quota, using the given formula:

$$\text{quota} = \frac{\text{valid poll}}{\text{number of seats} + 1} + 1$$

Answer:

(c) Tins of beans are cylindrical with a height of 11 cm and a diameter of 10 cm. Calculate the volume of a tin, correct to the nearest whole number.

$$V = \pi r^2 h$$

Answer:

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