Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Applied 2016

Mathematical Applications

(200 marks)

Friday 10 June
Morning 9:30 to 11:30

General Directions

1. Write your EXAMINATION NUMBER in this space:
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 superintendent only
Centre stamp

For the examiner only				
			Question	Mark
			1	
			2	
Cumulative check			3	
Running total			4	
– Disallowed			5	
= Total		↔	Total	

Credit

Question 1

(a) Five people divide a lunch bill of €122·50 equally between them.
Work out how much each person must pay.

Answer:

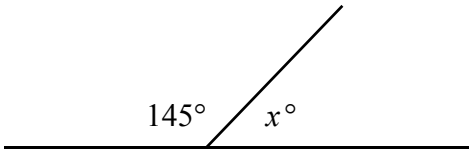
(b) A mobile phone normally costs €180. In a sale, its price is reduced by 15%.
Work out the **sale price** of the mobile phone.

Answer:

(c) Find the value of $(3{\cdot}14)^3$, correct to two decimal places.

Answer:

(d) Work out the value of x in the diagram below.



Answer:

(e) Add 7 kilometres, 40 metres, and 200 centimetres together. Give your answer in metres.

Answer:

(f) Convert €300 to sterling, using the exchange rate €1 = £0·7345 sterling.

Answer:

(g) A bus leaves Cork at 08:25 and arrives in Dublin at 13:10.
Work out how long the journey takes, in minutes.

Answer:

(h) A car travels 100 km in 1 hour and 15 minutes.
Find the average speed of the car, in km per hour.

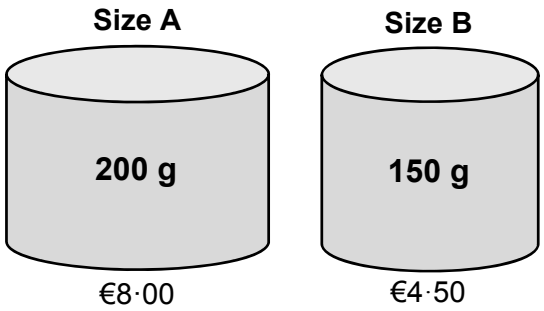
Answer:

(i) Write the following three numbers in order, from the smallest to the largest.

80% 0·084 $\frac{9}{11}$

Answer:

(j) A shop sells coffee in two sizes, size **A** and size **B**, as shown. Work out which size offers the **better value**. Show all your working out.



Answer:

Question 2: Research Element Question on Borrowing and Repayments

A bank offers the following lending rates for car loans.

Monthly Repayments			
Loan Amount	**Term**		
	2 years (24 months)	3 years (36 months)	5 years (60 months)
€0 – €5000	€47·20	€33·34	€22·13
€5000 – €10 000	€45·94	€32·06	€21·06
Note: the **monthly repayment** figures are **per €1000** and include all interest and charges.			

Pat wants to borrow **€8000** to buy a car. He will repay the loan over either 3 years or 5 years.

(a) Complete the table below to show the **monthly** repayments in each case.

Term	Loan amount	Monthly repayment per €1000	Total monthly repayment
3 years	€8000		
5 years	€8000		

(b) Write down one advantage for choosing each of these terms.

Advantage of 3-year loan:

Advantage of 5-year loan:

(c) Pat decides to take the 3-year loan for €8000.
Find the **total amount** that Pat will repay over the 3 years for this loan.

Answer:

(d) The bank uses the following rule to find the maximum term that they will give for a car loan:

Maximum term = 8 years minus the age of the car (in years)

Ann buys a car in 2015. The car is a 2013 Opel Astra.
What is the maximum term that the bank will give her, in 2015, for a loan for this car?

Answer:

(e) Gina has a credit card with an interest rate of 2% per **month**.
Work out the **APR** for this credit card, correct to the nearest percent.

Answer:

(f) Gina wants to buy a car for €3000. She plans to pay for it with her credit card, and then make repayments to her credit card over the next 2 years to pay off the cost of the car.

State **one disadvantage** of buying the car in this way, instead of getting a car loan from a bank.

Question 3

In the competition *Tullow's Got Talent*, the judges gave each person who entered a score from 1 to 8. All of the scores are shown in the following table.

James 4	Dee 8	Pat 2	John 6	Laura 4	Alex 6	Paul 7
Bill 3	David 7	Olive 4	Claire 5	Mary 2	Kate 7	Chris 5

(a) In total, how many people entered *Tullow's Got Talent* ?

Answer:

(b) Complete the **frequency table** below.

Score	1	2	3	4	5	6	7	8
Number of people					**2**		**3**	

(c) Draw a **graph** to represent the information in part **(b)**.
Label your graph clearly. Show any calculations that you make.

(d) One person was picked at random from the people who entered, and given a voucher. Find the **probability** that this person got a score of 5.

Answer:

(e) Anyone who scored **7 or more** qualified for the Grand Final.

Work out the **percentage** of the people in *Tullow's Got Talent* who qualified for the Grand Final. Give your answer correct to the nearest percent.

Answer:

(f) Work out the **mean** score in *Tullow's Got Talent*.

Answer:

Question 4

An office floor is $9{\cdot}8$ m long and $5{\cdot}2$ m wide.

(a) Construct a **scaled diagram** of this floor in the space below, using a scale of 1:100.

(b) Work out the **area** of the floor. Give your answer correct to the nearest m^2.

Answer:

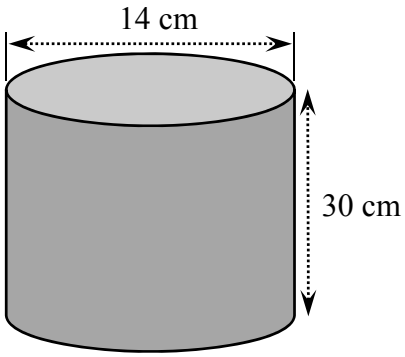
(c) The floor is covered with carpet costing €$23{\cdot}50$ per m^2.
Use your answer from part **(b)** to find the **cost** of the carpet needed.

Answer:

(d) Lynsey wants to tile the floor with square tiles. She allows 20 cm $\times$ 20 cm for each tile.
Work out how many tiles Lynsey will need to cover the floor.

Answer:

(e) A cylinder has a diameter of 14 cm and a height of 30 cm.
Find the **volume** of the cylinder, taking $\pi = 3 \cdot 14$.



Volume = $\pi r^2 h$

Answer:

(f) Barry folds a sheet of paper in half, making two layers of paper.
Next he folds it in half again.
He then folds it in half for a third time.

Find the total number of layers of paper in the folded sheet, after these three folds.

Answer:

Question 5

Michael is training for a triathlon.

(a) He buys energy gels to take during his training. His energy gels cost €2·15 each. He spends €34·40 on energy gels each month.

Find the number of energy gels he buys each month.

Answer:

(b) Michael gets the following training session from his coach:

Part 1	**Part 2**	**Part 3**
Run 800 m slowly to warm up.	Run the 5 sprints below. Run 50 m slowly between each two sprints. Sprints: • 100 m • 200 m • 400 m • 200 m • 100 m	Run 800 m slowly to warm down.

Find the **total distance** Michael will run during this training session, including both sprints and running slowly.

Answer:

Michael burns 200 calories each time he swims for 30 minutes.

(c) Find how many minutes he must swim for in order to burn 500 calories.

Answer:

(d) Write the correct unit next to each measurement in the table below.
Use m, m^2, or m^3 in each case.

Measurement	**Unit** (m, m^2, or m^3)
Length of a swimming pool.	
Volume of a swimming pool.	
Area of the bottom of a swimming pool.	
Width of a swimming pool.	

Tara had a gross income of €27 750 in 2015.

(e) Tara paid tax at a rate of 20% in 2015. Find Tara's **gross tax** for 2015.

Answer:

(f) Tara had a tax credit of €3300 in 2015. Find Tara's **net income** for 2015.

Answer:

(g) Name **one deduction**, other than income tax, that would have been taken from Tara's gross income in 2015.

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