



Coimisiún na Scrúduithe Stáit State Examinations Commission

Leaving Certificate Applied 2017

Mathematical Applications (200 marks)

Friday 9 June
Morning 9:30 – 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.

<i>For the superintendent only</i>		<i>For the examiner only</i>			
Centre stamp				Question	Mark
				1	
				2	
				3	
				4	
		<i>Cumulative check</i>		5	
		Running Total		Total	
		– Disallowed			
		= Total			

Credit

Question 1

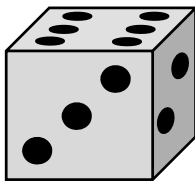
- (a) John lodges three cheques worth €24.67, €23.89, and €123.54. Find the **total amount** he lodges.

[illegible]

- (b)** A medicine bottle has a volume of 350 ml. How many single doses of 25 ml are in the bottle?

[illegible]

- (c) A regular unbiased die is rolled once. Find the **probability** of rolling a 5.



Answer:

- (d)** Find the value of $\sqrt{68}$, correct to two decimal places.

Answer:

- (e)** A sports drink has the following two special offers:

Offer **A**:
6 bottles for €8

Offer **B**:
10 bottles for €14

Which offer gives better value for money, **A** or **B**? Use calculations to justify your answer.

[illegible]

- (f) Find the **volume** of a **cube** with sides of length 4 cm.

	Answer:
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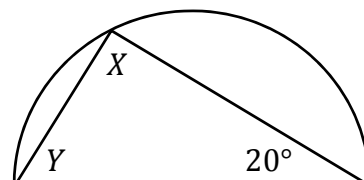
- (g) Melissa has a gross weekly income of €645.
Each week she pays €65.54 in income tax, €25.80 in PRSI, and €21.88 in USC.
Work out her **net** weekly income.

	Answer:
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- (h) Work out the number of hours in 3 full weeks.

	Answer:
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- (i) The diagram on the right shows a triangle and a semi-circle.
One of the sides of the triangle is a diameter of the semi-circle.
Find the size of the angle X and the size of the angle Y .



	<div style="display: flex; justify-content: space-between;"> $X =$ $Y =$ </div>
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- (j) The heights of five students are shown below.

157 cm 183 cm 173 cm 169 cm 168 cm

Work out the **mean (average)** height of the five students, in cm.

	Answer:
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The following are the instructions for a ballot paper in a class election:

Write "2" beside the candidate of your second choice, if you have one.

All the ballot papers are shown below.

Peter 1 Aoife James 2	Peter 2 Aoife 1 James 3	Peter 1 Aoife 3 James 2	Peter 2 Aoife 1 James	Peter 1 Aoife 1 James 1	Peter 1 Aoife 3 James 2
Peter Aoife James	Peter 1 Aoife 3 James 2	Peter 3 Aoife 1 James 2	Peter 1 Aoife 2 James	Peter Aoife James 1	Peter 2 Aoife 3 James 1
Peter Aoife 1 James	Peter X Aoife X James	Peter 2 Aoife James 1	Peter 3 Aoife 1 James 2	Peter Aoife James	Peter 1 Aoife 2 James 3

- Total Poll =

	14

Number of Spoiled or Blank Votes =

Valid Poll =

- Work out the **quota** using the formula below. Show all your work.

$$\text{Quota} = \frac{\text{Valid Poll}}{\text{Number of seats} + 1} + 1$$

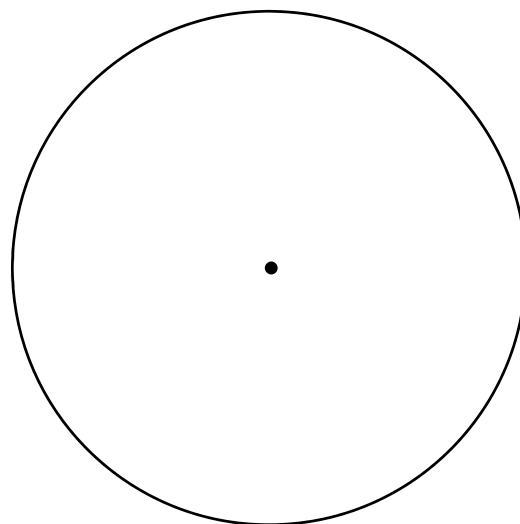
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- (c) Complete the table below to show the **number** and **percentage** of first preference votes that each candidate got. Give each percentage correct to the nearest percent.

	Peter	Aoife	James
Number of first preference votes			3
Percentage of first preference votes			21%

- (d)** Construct a **pie chart** to show how many first preference votes each candidate got. Label each sector clearly. Show all of your calculations.

Calculations:



- (e) No candidate reached the quota on the first count, so a second count was needed. James was eliminated with the fewest votes. Complete the table below to show the results of the **second count**.

	First Count	Transferable Votes Received	Second Count
Peter			
Aoife			

- (f) Explain** what is meant by a “non-transferable vote”.

[illegible]

Eibhlín and Máire are building a wall using rectangular bricks. They lay the bricks in rows of equal length to make the wall.

- [illegible]

Answer:

- [illegible]

- [illegible]

- (c) Eibhlín and Máire build the wall using red bricks and yellow bricks. They buy **twice** as many red bricks as yellow bricks.

Find the number of **red** bricks they buy. Remember that they buy 120 bricks in total.

Answer:

- (d)** Máire has the following information about the mortar they will need for the wall:

For every 50 kg of cement, you will need 175 kg of sand.

Máire is going to use 30 kg of cement.

Find how many kilograms of **sand** she will need.

[illegible]

Question 4

- (a) Maitiú and Odhran buy a €10 lottery ticket. Maitiú pays €7 and Odhran pays €3. They agree to split any winnings in that ratio.

They win €234 400. Find how much money each of them will get.

	Maitiú gets:	Odhran gets:

- (b) Maitiú is going to spend some of his winnings on a holiday to Florida. He changes €450 into dollars. The exchange rate is €1 = \$1.12.

Find how many dollars (\$) he will get.

	Answer:
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- (c) Maitiú wants to know how long the flight from Dublin to Atlanta will take. He knows that the local time in Atlanta is five hours behind Ireland. He reads the following table. All times are local.

Departure from Dublin	Arrival in Atlanta
10: 10	14: 01

Find how long the flight will take.

	Answer:
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- $$C = \frac{5 \times (F - 32)}{9}$$

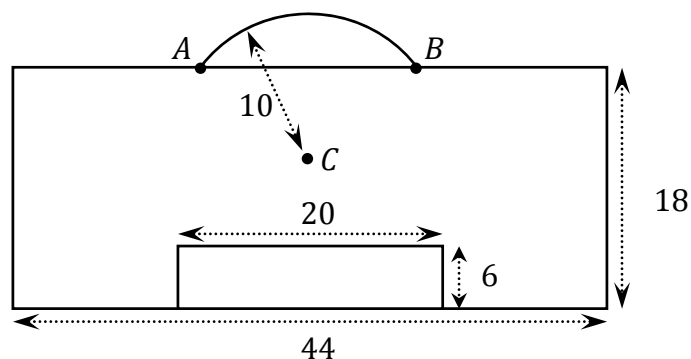
- | | | |
|---------------|---|-----|
| $\frac{3}{4}$ | = | 75% |
| 0.04 | = | |
| $\frac{2}{5}$ | = | |
| 6.76 | = | |

- | Original Number | | New Number | Change (if any) |
|-----------------|---|------------|-----------------|
| 2345·7 | → | 234·57 | Divide by 10 |
| 34·67800 | → | 34·678 | |
| 564·7676 | → | 564·77 | |
| 56 789 | → | 57 000 | |

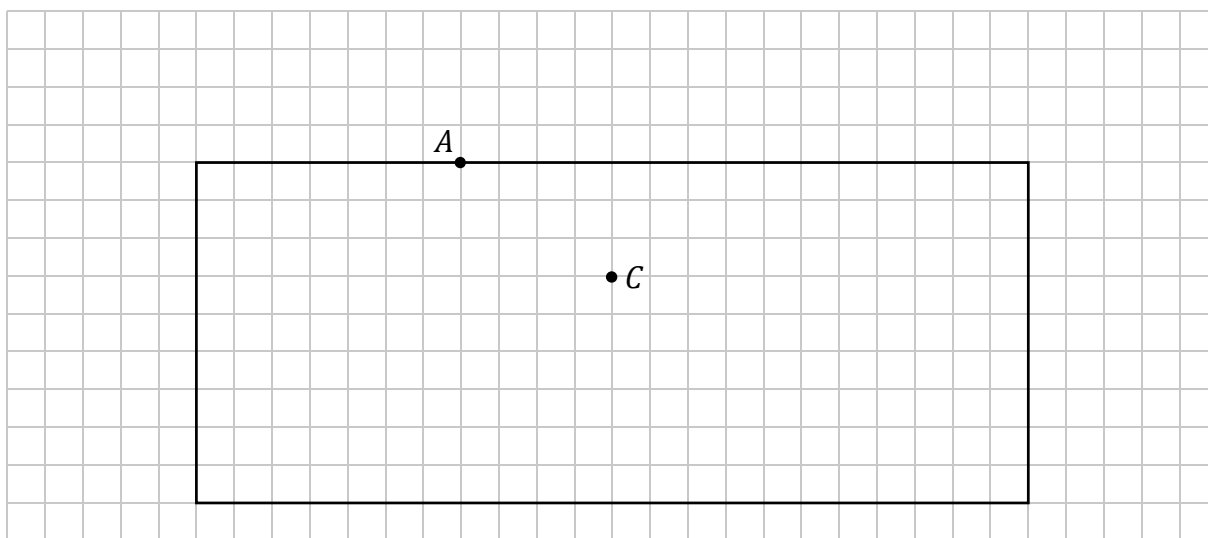
No change
to the value

Question 5

- (a) A penalty box from a soccer pitch is shown in the diagram below. It is made up of two rectangles and an arc of a circle. All distances are in yards.
- The arc from A to B is part of a circle with centre C and radius 10 yards.
- The penalty box is symmetrical about a line through C .



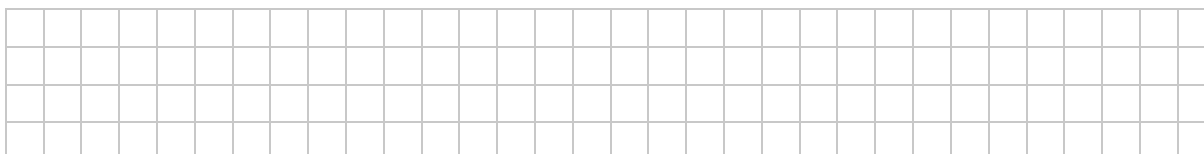
- (i) Part of a scaled diagram of the penalty box is shown below. The length of the side of each small square in the grid represents 2 yards.
- Use a compass and straight edge to **complete** the scaled diagram, as accurately as you can. **Label** the point B .



- (ii) Use a ruler to measure the **distance** from A to B on your diagram, in cm. Hence, or otherwise, find the **actual distance** from A to B , in yards.

Distance on diagram (cm) =

Actual distance (yards) =



- (b)** The soccer pitch is in the shape of a rectangle. It is 105 m long and 68 m wide.

(i) Find the length of the **perimeter** of the soccer pitch.

[illegible]

(ii) Find the **area** of the soccer pitch.

[illegible]

- (c)** Another pitch has an area of 6800 m^2 . It is being covered with grass seed.

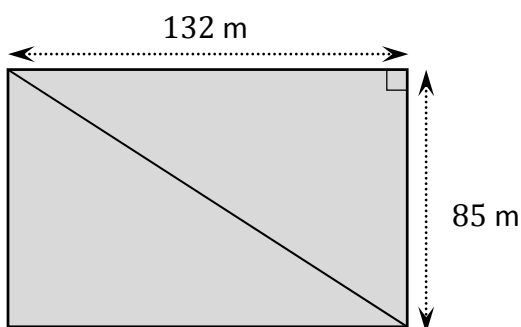
One bag of seed will cover 500 m^2 of the pitch, and costs €120.

Only full bags of seed may be bought – it is not possible to buy part of a bag.

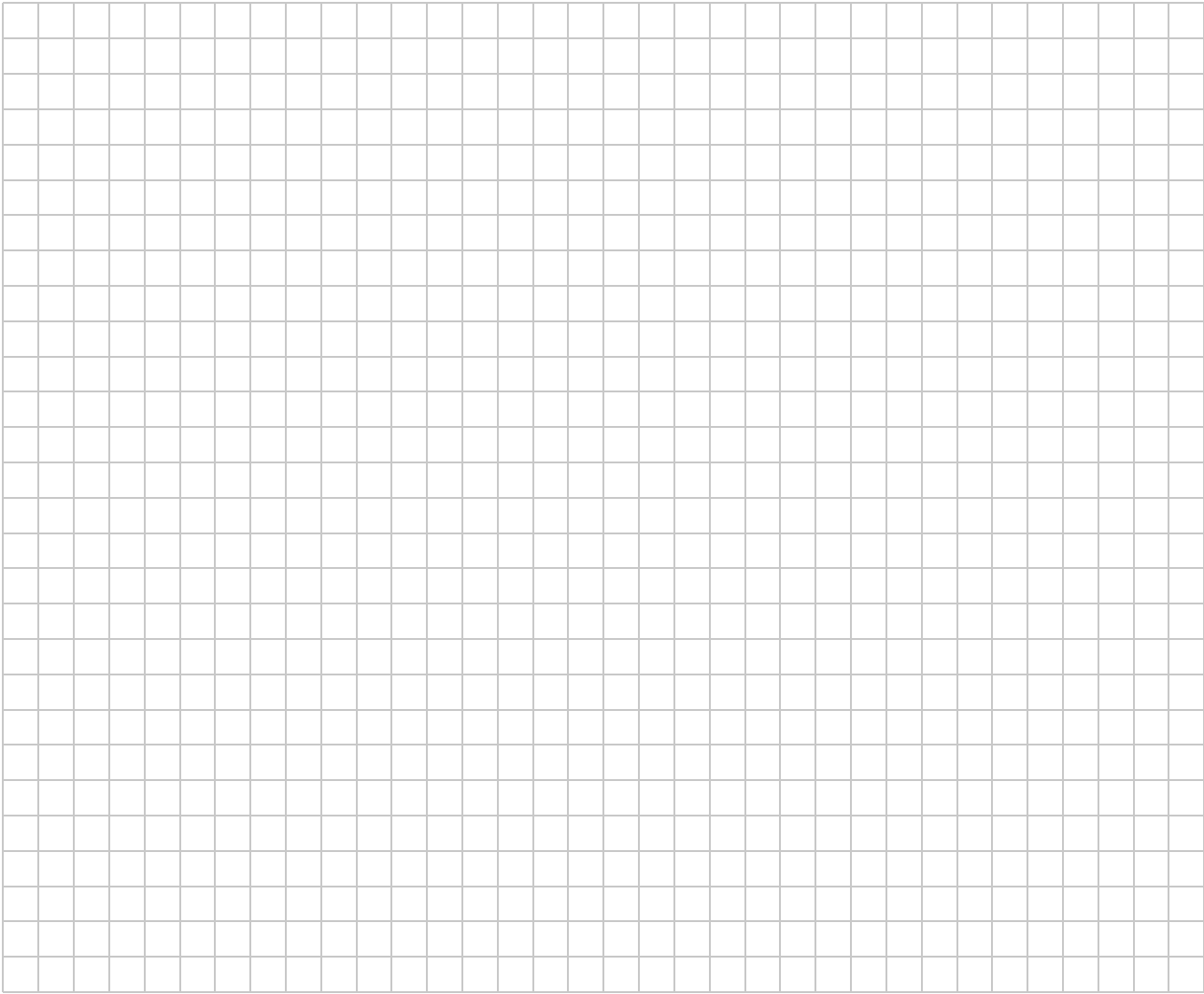
Find the **total cost** of the bags of seed needed to cover the pitch.

Answer:

- (d) A rectangular GAA pitch has a length of 132 m and a width of 85 m.
Use the theorem of **Pythagoras** to find the length of the **diagonal** of the pitch.



Answer:



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