

Part A

CCT Weekly Practice Mathematics

Unit 1 – Pizza Story



Source: iStock by Getty images

A medium sized pizza of diameter 36 cm was made in a restaurant. It also has 18 equally sized pepperoni pieces arranged uniformly on its surface. The diameters of large and small pizzas made in the restaurant are 48 cm and 20 cm respectively. The restaurant doesn't change the size of the pizzas for any order given.

Q 1: If the uniform thickness of the pizza is 0.5 cm then what is the volume of dough used for making a medium sized pizza?

- a) $648\pi \text{ cm}^3$
- b) $324\pi \text{ cm}^3$
- c) $288\pi \text{ cm}^3$
- d) $162\pi \text{ cm}^3$

Q 2: A chef finds $1000\pi \text{ cm}^3$ of pizza dough in the fridge. A given number of small and medium sized pizzas are made to reduce the wastage of dough. What will be the number of medium sized pizzas made in that case when the least amount of dough is wasted?

- a) 1
- b) 2
- c) 4
- d) 5

Q 3: Assume that the number of pepperoni pieces placed on the pizza is proportional to the square of radius of the pizza. What will be the approximate number of pepperoni pieces on an extra-large pizza with diameter 54 cm?

- a) 27
- b) 40
- c) 54
- d) Cannot be calculated

Unit 2 – Routes to cities

A,B,C,D,E,P,Q,R are cities that are located in the same country. A direct route represents a two-way road connecting two cities.

There are 2 direct routes connecting cities A and B and 3 direct routes connecting cities B and C.

The table below shows the number of direct routes across various other cities.

Cities	No.of direct routes to City P	No.of direct routes to City Q	No.of direct routes to City R
A	1	1	0
B	2	3	0
C	0	1	2

Q 4: The possible number of ways in which one can travel from A to R without crossing a city more than once is _____

- a) 18
- b) 30
- c) 38
- d) 56

Q 5: Which of the following statements **CANNOT** be concluded with the given information?

- a) There are fewer ways to travel from A to B than from P to R without crossing any city more than once.
- b) Travelling from A to R is the same as travelling from R to P
- c) It is possible to travel from B to R through A.
- d) For a person to travel from A to C, it is not possible to cross through R

Source of questions: Centre for Teacher Accreditation (CENTA®) – m.centa.org
More practice questions and free learning resources available on m.centa.org.

Part B

ACID RAIN

Below is a photo of statues called Caryatids that were built on the Acropolis in Athens more than 2500 years ago. The statues are made of a type of rock called marble. Marble is composed of calcium carbonate.

In 1980, the original statues were transferred inside the museum of the Acropolis and were replaced by replicas. The original statues were being eaten away by acid rain.



Question 8: Normal rain is slightly acidic because it has absorbed some carbon dioxide from the air. Acid rain is more acidic than normal rain because it has absorbed gases like sulfur oxides and nitrogen oxides as well.

Where do these sulfur oxides and nitrogen oxides in the air come from?

.....
.....
.....

The effect of acid rain on marble can be modelled by placing chips of marble in vinegar overnight. Vinegar and acid rain have about the same acidity level. When a marble chip is placed in vinegar, bubbles of gas form. The mass of the dry marble chip can be found before and after the experiment.

Question 9: A marble chip has a mass of 2.0 grams before being immersed in vinegar overnight. The chip is removed and dried the next day. What will the mass of the dried marble chip be?

- A. Less than 2.0 grams
- B. Exactly 2.0 grams

- C. Between 2.0 and 2.4 grams
- D. More than 2.4 grams

Question 10: Students who did this experiment also placed marble chips in pure (distilled) water overnight. Explain why the students included this step in their experiment.

.....

.....

.....

CCT Weekly Practice Mathematics

Part A

Answers

- (d) The volume of dough used is the area of the pizza multiplied by its thickness.
 $\text{Area} = \pi \times 18 \times 18 \times 0.5 = 162\pi \text{ cm}^3$
- (c) Having 4 medium sized pizzas means the number of small sized pizzas will have to be 7.
 $50\pi \text{ cm}^3 \times 7 + 162\pi \text{ cm}^3 \times 4 = 998\pi \text{ cm}^3$
 This will lead to the wastage of $2\pi \text{ cm}^3$ dough which is the least amount of dough wasted in any given scenario.
- (b) The direct variation of the square of radius of the pizza (r) and number of pepperoni pieces (N) was considered to arrive at the answer
 $N = k \times r^2$ (k is the constant of proportionality)
 From the given data, N=18 and r = 18 we get that $k = \frac{1}{18}$. Using the value of 'k', N is calculated for r = 27 and it is close to 40.
- (d) The possible ways for travelling from A to R as shown below
 $A \rightarrow B \rightarrow C \rightarrow R = 12$ ways
 $A \rightarrow Q \rightarrow B \rightarrow C \rightarrow R = 18$ ways
 $A \rightarrow P \rightarrow B \rightarrow C \rightarrow R = 12$ ways
 $A \rightarrow P \rightarrow B \rightarrow Q \rightarrow C \rightarrow R = 12$ ways
 $A \rightarrow Q \rightarrow C \rightarrow R = 2$ ways
 Therefore, there will be a total of 56 possible ways to travel from A to R.
- (b) The distance between the cities or the relative locations of the cities are not given. Hence, this cannot be concluded.

Source of questions:

Centre for Teacher Accreditation (CENTA®) – m.centa.org

More practice questions and free learning resources available on m.centa.org.

The solution for Part B is explained in Video Solution.