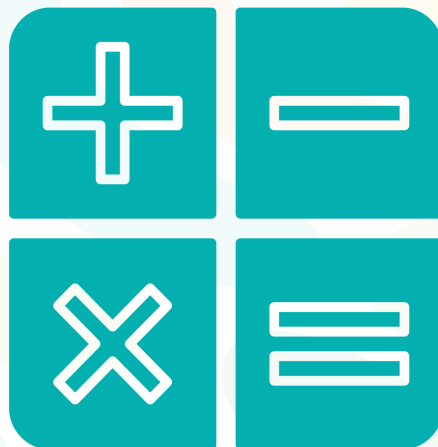




# **BRAINIACS OLYMPIAD**

## **GRADES 5-6 MATHEMATICS SAMPLE PAPER PRACTICAL PART**



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## MATHEMATICS SAMPLE PAPER-GLOBAL FINAL

Grade: 5-6

Time: 120 minutes

Total points: 100

Q1.

A student has a rectangular eraser with a length of 5 cm, a width of 3 cm, and a height of 2 cm. If the student uses the eraser so that its volume decreases by exactly 25%, what is the remaining volume of the eraser?

- A)  $7.5 \text{ cm}^3$
- B)  $15.0 \text{ cm}^3$
- C)  $22.5 \text{ cm}^3$
- D)  $30.0 \text{ cm}^3$

Q2.

In the exam hall, the floor is covered with square tiles. A row of tiles consists of alternating white and grey tiles.

If a specific row starts and ends with a white tile and contains a total of 47 tiles, what is the ratio of white tiles to grey tiles in the row?

- A) 23:24
- B) 24:23
- C) 1:1
- D) 47:23

Q3.

A proctor is distributing exam papers. He notices that if he carries the papers in stacks of 12, he has 5 papers left over. If he carries them in stacks of 15, he also has 5 papers left over.

What is the smallest possible number of exam papers the proctor could be carrying?

- A) 60
- B) 185
- C) 125
- D) 65

Q4.

To encourage focus, the Exam Store allows students to “borrow” a high-quality highlighter for a principal cost of 1,200 points. The store charges simple interest at a rate of 5% per hour.

If a student borrows the highlighter at the start of the 120-minute exam and returns it exactly when the timer ends, what is the total number of points (Principal + Interest) the student must pay back?

A) 1320 points

B) 1260 points

C) 1210 points

D) 1440 points

Q5.

An analog clock hangs on the wall of the exam hall. At exactly 10:10 AM, what is the measure of the smaller angle formed between the hour hand and the minute hand?

A)  $110^\circ$

B)  $115^\circ$

C)  $120^\circ$

D)  $125^\circ$

Q6.

An exam booklet has its pages numbered starting from 1. A student tears out one leaf (which contains two pages, one on each side). The sum of the remaining page numbers is 99.

If the booklet originally had 15 pages (one side of the last leaf was blank), which page numbers were on the leaf that was torn out?

A) 10 and 11

B) 9 and 10

C) 7 and 8

D) 12 and 13

Q7.

Use your ruler to measure the length and width of the rectangular top of the desk you are currently using to the nearest centimeter.

a) Record your measurements. Calculate the perimeter and the area of your desk surface in cm and  $cm^2$ .

b) If you were to cover the entire surface of your desk with standard A4 exam sheets (each measuring 21 cm  $\times$  30 cm) without overlapping or cutting them, what is the maximum number of full sheets that can fit?

c) Calculate the percentage of the desk's area that remains uncovered in part (b).

d) Suppose the width of the desk increases by 10% and its length decreases by 10%.

Does the area increase, decrease, or stay the same?

Show your calculation using your measured values.

Q8.

The exam hall seats are arranged in a grid of 10 rows and 10 columns. The seats are numbered from 1 to 100, starting from Row 1, Column 1 (Seat 1), moving across the row to Column 10 (Seat 10). The next row then begins with Seat 11 at Row 2, Column 1, and the pattern continues.

a) Student A is in Seat 43 and Student B is in Seat 77.

How many rows apart and how many columns apart are they?

(Answer: 3 rows apart and 4 columns apart)

b) A "Prime Seat" is a seat whose number is a prime number.

How many Prime Seats are there in the 5th row?

(Answer: 3)

c) The proctor places a "Good Luck" sticker on every seat number that is a multiple of 6, and a "Great Effort" sticker on every seat number that is a multiple of 8.

How many seats receive both stickers?

(Answer: 4)

d) If the proctor starts at Seat 1 and moves in a snake pattern (right across Row 1, left across Row 2, right across Row 3, and so on), what is the seat number located at Row 4, Column 3?

(Answer: 38)

Q9.

The invigilator is organizing a "Correction Fund" using simple interest. He places  $P$  dollars of entry fees into an account.

a) If the principal  $P$  is \$1200 and the simple interest rate is 5% per year, how much interest is earned after 9 months?

(Answer: \$45)

b) After a certain time  $T$  (in years), the total amount in the account (Principal + Interest) becomes \$1500.

If the interest rate is 4%, find  $T$ .

(Answer: 6 years and 3 months)

c) Two different accounts are opened:

- Account A: \$1000 at 6% simple interest
- Account B: \$1200 at 3% simple interest

After how many years will both accounts have the same total balance?

(Answer: 8 years and 4 months)

Q10.

A student is bored during the final minutes of the exam and begins numbering the pages of their blank scratchpad, starting from Page 1.

a) If the student uses exactly 252 digits to number the pages, how many pages are in the scratchpad?

(Answer: 120)

b) The student adds all the page numbers written:

$$1 + 2 + 3 + \cdots + n$$

However, one page number was accidentally counted twice, and the final total became 7,000.

Which page number was counted twice?

(Answer: 97)

c) Suppose the scratchpad has 100 pages. The student places a “Star” sticker on every page number that is a multiple of 3, and a “Square” sticker on every page number that contains the digit 7.

How many pages receive exactly one sticker?

(Answer: 40)

d) If the student spends 2 seconds writing each digit, how many minutes and seconds did it take to number the scratchpad from part (a)?

(Answer: 8 minutes and 24 seconds)