



MISMO
Maarif Inter School Maths Olympiad

An initiative of



PAK-TURK MAARIF
INTERNATIONAL SCHOOLS & COLLEGES



MISMO 2022

Syllabus and Sample Questions – Grade 8

For Detailed Information Login to:  www.mismo.pk

MISMO Syllabus – Grade 8

MISMO Content Assessment Percentage

Content Domains	Percentages
Numbers and Algebra	50%
Measurement and Geometry	30%
Data Handling	20%

Numbers and Algebra

Real Numbers

- Find HCF and LCM, evaluate positive integer powers of numbers,
- Evaluate square and square roots, cube and cube roots and solve related problems.
- Compute and solve problems with positive and negative numbers, including through movement on the number line or various models (e.g., losses and gains, thermometers).
- Demonstrate understanding of properties of rational numbers and operations on rational numbers.
- Simplify mathematical expressions involving Rational Numbers.
- Round off numbers to the required number of decimal places and significant figures
- Perform operations on sets (union, intersection, difference and complement).

Fractions and Decimals

- Using various models and representations, compare and order fractions and decimals, and identify equivalent fractions and decimals.
- Compute with fractions and decimals, including real world situations.

Ratio, Proportion, and Percentage

- Identify and find equivalent ratios; model a given situation by using a ratio; divide a quantity according to a given ratio.
- Solve problems involving direct and inverse proportions: and percentage change.
- Evaluate profit, loss and discount percentage and solve real world situations.
- Solve problems involving service charge and GST, income tax and commission.
- Calculate simple interest and compound interest.

Algebra

Expressions, Operations, and Equations

- Find the value of an expression or formula when the values of the variable are given.
- Simplify algebraic expressions involving sums, products, and powers; compare expressions to determine if they are equivalent.
- Write expressions, equations, or inequalities to represent problem situations.
- Solve linear equations, linear inequalities, and simultaneous linear equations in two variables, including those that model real-life situations.
- Interpret, relate and generate representations of nonlinear functions (quadratic) in tables, graphs, or words.
- Generalize pattern relationships in a sequence using numbers, words, or algebraic expressions.
- Solve situations involving quadratics equations in real world situations.
- Solve linear inequalities and illustrate solution on the number line.
- Apply laws of Indices and solve real life problems involving Standard Form.

Relationships and Functions

- Interpret, relate, and generate representations of linear functions in tables, graphs, or words.
- identify properties of linear functions including slope and intercepts.
- Solve problems involving points in the Cartesian plane.
- Draw graphs of linear equations in the form of $ax + by = k$
- Solve problems involving linear graphs in real world contexts
- Solve simultaneous linear equations in two variables using Graphical Method.

Measurement and Geometry

- Identify and draw types of angles and pairs of lines and use the relationships between angles on lines and in geometric figures to solve problems,
- Identify two-dimensional shapes and use their geometric properties to solve problems.
- Solve problems involving perimeter, circumference, area, and the Pythagorean Theorem.
- Identify three-dimensional shapes (pyramid, sphere, cone) and use their geometric properties to solve problems,
- Solve problems involving the volume and surface area of pyramid, cone and sphere.
- Identify line and rotational symmetry in plane figures.
- Recognize geometric transformations (translations, reflections, and rotations) in the plane.
- Identify congruent and similar triangles and rectangles and solve related problems.

Data handling

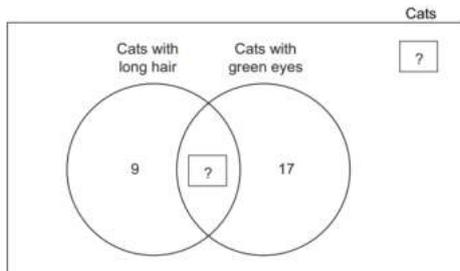
- Read and interpret data from tables, pictographs, bar graphs, line graphs, pie charts scatter diagrams, histograms etc.
- Calculate mean, median, mode, and range of data distributions.



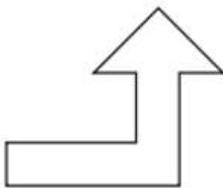
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SAMPLE QUESTIONS

Sample Questions MISMO 2022 – Grade 8

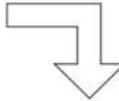
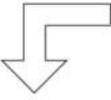
Sana recorded data about cats in her village. 14 cats have long hair.



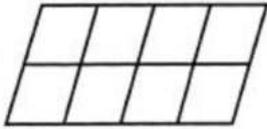
- How many cats have long hair and green eyes?
 - 9
 - 17
 - 5
 - 31
- In total Sana recorded 43 cats. How many cats do not have long hair or green eyes?
 - 10
 - 12
 - 14
 - 17
- Nahyan draws an arrow



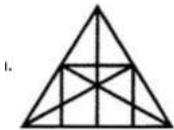
Which of these arrows is a reflection of Nahyan's arrow?

- 
- 
- 
- 

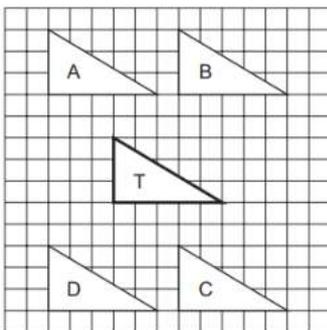
4. How many parallelogram are there in the given figure?



- A. 20
 B. 24
 C. 28
 D. 30
5. Count the minimum number of straight lines in the following figure.



- A. 8
 B. 9
 C. 10
 D. 12
6. Which triangle shows triangle T after a translation of 3 squares right and 5 squares down?



- A. Triangle A
 B. Triangle B
 C. Triangle C
 D. Triangle D
7. Which of the following has the greatest value?
- A. 50% of 10
 B. 40% of 20
 C. 30% of 30
 D. 20% of 40

8. Bina bought a game in the USA for \$15.

Amna bought the same game in Zambia and paid the equivalent price in Zambian Kwacha (ZK).

Exchange Rate

$$1\text{ZK} = \$0.075$$

Calculate the price that Amna paid.

- A. 75 ZK
B. 100 ZK
C. 175 ZK
D. 200 ZK
9. You are buying several birds and a birdcage. The birdcage costs \$25 and the birds costs \$8 each. If you have \$50 altogether to spend on birds and the birdcage, how many birds can you buy?
- A. 2
B. 3
C. 4
D. 6
10. A rectangle has a perimeter of 40 m and an area of 36 m². A smaller rectangle has a perimeter of 20 m. What is the area of the smaller rectangle?
- A. 9 m²
B. 18 m²
C. 20 m²
D. 72 m²
11. Amna is making a photo quilt by transferring photo to 48 rectangular pieces of fabric. Each rectangle is 3 cm long and 2 cm wide. The fabric she bought is 24 cm long. How wide piece of fabric do she need?
- A. 8 cm
B. 12 cm
C. 16 cm
D. 18 cm
12. Which formula can be used to determine the volume of the hemisphere?
- A. $V = (\pi r^2)/2$
B. $V = 2\pi r^2$
C. $V = r^3/2$
D. $V = (2\pi r^3)/3$

13. The population of a town has doubled every 10 years for the last 30 years. The current population is 10,000. What was the population 30 years ago.
- A. 1250
B. 1750
C. 2500
D. 5000
14. A rectangular swimming pool has a length of 10 m and width of 8 m. The water in the pool has a depth of 6 m. The water in the pool has a depth of 6 m. If you add 40 m^3 of water to the pool, how much the depth of water increase.
- A. 2 cm
B. 6 cm
C. 1 m
D. 2 m
15. You pay \$7.50 for 3 litres of strawberries juice. Later, you realise your recipe calls for 5 litres of strawberries juice. How much will the additional strawberries juice cost?
- A. \$2.50
B. \$5.00
C. \$5.50
D. \$12.50
16. The number of calories in one serving of any food is the sum of the calories from fat, protein, and carbohydrate. The table shows the calories in 1 gram of each of the three food components.

Component	Calories in 1 gram
Fat	9
Protein	4
Carbohydrate	4

A serving of cheddar cheese contains 14 grams of fat, 11 grams of protein and 1 gram of carbohydrate. How many calories are in a serving of cheddar cheese?

- A. 70 calories
B. 141 calories
C. 174 calories
D. 234 calories

17. You collect mini cars and display them on shelves that hold 20 cars each.
Which expression describes the number of shelves needed for any number of miniature cars.
- A. $\frac{x}{20}$
B. $\frac{20}{x}$
C. $20x$
D. x
18. A gardener has a rectangular garden with a length of 10 feet and a width of 5 feet.
The gardener plans to increase the length of the garden by 3 feet.
What will the area of the enlarged garden be?
- A. 25 ft^2
B. 26 ft^2
C. 65 ft^2
D. 80 ft^2
19. The ideal height (in cm) of a mountain bike frame is about 10 cm less than two thirds of the bike riders leg length (in cm). Two riders leg lengths are 80 cm and 85 cm. To the nearest tenth of a cm, how much taller should the taller mountain bike frame be?
- A. 3.3 cm
B. 5.0 cm
C. 13.3 cm
D. 23.3 cm
20. You are comparing two dorm-size refrigerators, both with cube shaped interiors.
One model has an interior edge length of 14 in. Another model has an interior edge length of 16 in.
How many more cubic inches of storage space does a larger model have?
- A. 8
B. 360
C. 1352
D. 4096
21. If $(x, 3)$ is a solution to the equation $5x - 2y = 44$. What is the value of x ?
- A. 6
B. 9
C. 10
D. 12

22. A class consists of 12 girls and 17 boys.

Girls had an average of x points on a test, while boys had an average of y points.

Which expression gives the average test score for the entire class?

- A. $\frac{x+y}{2}$
- B. $\frac{12x+17y}{29}$
- C. $\frac{x+y}{29}$
- D. $29 \left(\frac{x}{12} + \frac{y}{17} \right)$

23. The area of a rectangle is given by $3\ell^2+11\ell=20$, in which ℓ is the rectangle length.

What is the length of the rectangle?

- A. $\frac{1}{3}$
- B. $\frac{4}{3}$
- C. 4
- D. 5

24. A rectangular pool is 5m wide and 12m long. You swim diagonally across the pool.

How far do you swim?

- A. 13 m
- B. 17 m
- C. 36 m
- D. 60 m

25. A ladder is 7 m long is placed against a house.

The bottom of the ladder is 4 m from the base of the house.

How far up the house does the ladder reach?

- A. $\sqrt{13}$ m
- B. $\sqrt{23}$ m
- C. $\sqrt{33}$ m
- D. $\sqrt{43}$ m