Mathematics Admissions Exam
Learning Outcomes and Sample Questions

Subject	Mathematics		
Grade of Entry	9		
Admission Year	AY 2023-2024		
Exam Specifications	Number of Questions	20	(5 marks each question)
	Type of Questions	Multiple Choice	(with 4 Options)
	Exam Duration	45 minutes	
	Calculators	Not Allowed	
	Language	Questions are written both in English and Arabic	

Learning Outcomes Tested for Entry to Grade 9: Mathematics

The Mathematics Admissions exam is made up of questions that are derived from the below learning Outcomes:

1. Use order of operations to evaluate complex numerical expressions (Understand the order of operations)
2. Use different properties of equality to solve a linear equation with variable on each side
    - Use cross multiplication to simplify rational equations into linear equations with variables in each side then solve the resulting equation
    - Combine like terms to simplify an equation with variable on each side to become of the form $\boldsymbol{ax + b = cx + d}$ then solve the resulting equation
    - Use the distributive property to simplify an equation with variable on each side to become of the form $\boldsymbol{ax + b = cx + d}$ then solve the resulting equation
    - Conclude that an equation has no solution if it simplifies to an always false statement
    - Conclude that an equation has infinitely many solutions if it simplifies to an always true statement
3. Solve a given equation for a variable
4. Translate a given sentence into a linear equation
5. Determine whether or not a relation is a function by identifying the number of outputs assigned to each input
    - A relation can be given as a set of ordered pairs, in table format, or as a graph
6. Understand the absolute value of a number
7. Solve an absolute value equation by reasoning which of the given values makes it correct
8. Solve rate and ratio real-life problems
9. Solve problems involving proportional relationships (Identify the constant of proportionality)
10. Solve problems involving proportions
11. Calculate percent of increase/decrease in a real-life problem
12. Solve real-life problems involving percentages
13. Solve problems to find prices after a discount or to find the original price given the discounted price
14. Solve reasoning problems with exponents
15. Solve systems of two linear equations
16. Translate a real-life problem into a system of two equations and solve it
17. Solve one-step and two-step linear inequality: Extend to compounded inequality by reasoning
18. Find slope of a line
19. Find equation of a straight line that passes through two given points
20. Find equation of a straight line passing through a given point and is parallel or perpendicular to a given line
21. Find volumes of cylinders and rectangular prisms
22. Find the mean (average) give a set of numbers
23. Find the median given a bar graph
24. Find missing measures in a rectangle. Recall that:
    - Diagonals bisect each other
    - Opposite sides are congruent
25. Understand that if two parallel lines are cut by a transversal, then pairs of consecutive interior angles are supplementary

Sample Questions for Entry to Grade 9: Mathematics

All questions in the exam will be translated in Arabic as in Question 1 below.
Q2-Q10 in this sample set are only in English for practice.

1. Simplify the expression below:

بسّط التعبير أدناه:

$$[(-1)^4 \times (3)^2 + (2)^3] - 2^4 \div 4$$

A. 1
B. 0.25
✓ C. 13
D. 14

2. Which of the following linear equations has no solutions?

A. $x + 5 = x + 5$
✓ B. $3x - 4 = 3(x - 2)$
C. $3x - 4 = 2x + 6$
D. $2(x + 5) = x - 6$

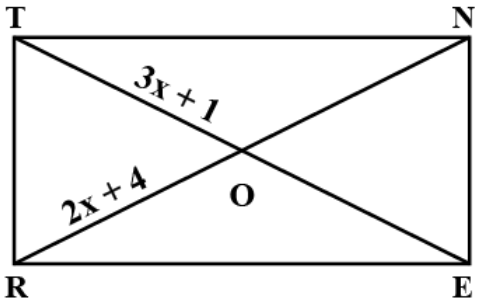
3. Solve the equation to find the value of x.

$$\frac{3(x-3)}{6} = \frac{3x-5}{14}$$

✓ A. 4
B. 1
C. 0.25
D. 2

4. TNER is a rectangle. Find the length of RO.

A. 3
B. 4
C. 6
✓ D. 10



5. Solve the below equation to find all the possible values of x.

$$|2x + 9| = 3$$

A. $x = -3$
B. $x = 3, x = -6$
✓ C. $x = -3, x = -6$
D. $x = 3, x = 6$

6. If x is a positive real number and $x^4 = 2$, what is the value of $\frac{x^{12}}{8}$?

✓ A. 1

B. 2

C. 4

D. 8

7. What is the solution of the inequality?

$$-1 \leq 11 - \frac{2}{3}x < 3$$

A. $-6 \leq x < -3$

✓ B. $12 < x \leq 18$

C. $-6 < x \leq -3$

D. $12 \leq x < 18$

8. Write the equation of the line that passes through $(-6, 1)$ and is perpendicular to $y = -2x + 5$.

✓ A. $y = 0.5x + 4$

B. $y = -0.5x - 4$

C. $y = 0.5x + 3$

D. $y = -0.5x - 2$

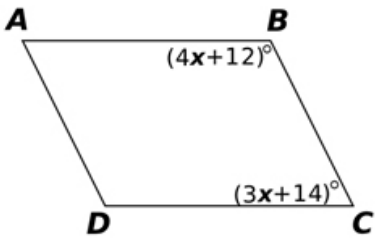
9. $ABCD$ is a parallelogram. Find the measure of angle B in degrees.

A. 22

B. 92

C. 98

✓ D. 100



10. Find the volume of the cylinder shown below.

A. 169π

B. 325π

C. 25π

✓ D. 350π