Requirements for Admission Math entrance exam

- Total number of questions is 16.
- Total time for completing the test is 2 hours.
- The lowest required score is 40 points.

The list of topics to be revised for the test.

1. BASIC LEVEL (66 POINTS)

There are 8 questions on 6 topics, one for each topic plus 2 additional random ones.

- Linear inequalities (10 points)
- Percentages (10 points)
- Substituting and evaluating expressions (10 points)
- Square equations (10 points)
- Order of operations and calculations (8 points)
- The distributive property & equivalent expressions (8 points)

The additional questions cost 5 points each.

EXAMPLE

1. Solve for x: $-3 - 3x > 7x - 9$.

2. There are 40 students in a university group, 16 of them are boys. Determine what percentage of students are girls.

3. Evaluate $6t - 20 - 32u$ when $t = 4$ and $u = 1/8$.

4. Solve the equation $2x^2 + x - 10 = 0$ and find its positive root.

5. Calculate: $9\left(\frac{5}{7} \cdot 2\frac{1}{3} \cdot \frac{5}{6} - 1\right) : \left(1 - \frac{7}{8} \cdot 1\frac{3}{5} \cdot \frac{3}{14}\right)$.

6 Simplify to create an equivalent expression: $2(3x - y) - 6(5x + 3y)$.

2. ADVANCED LEVEL (34 POINTS)

There are 8 questions on 6 topics.

- Domain of a function (5 points)
- Factoring (5 points)
- Investigating functions using derivatives (5 points)

• Tasks involving movement or work (2 questions, 4 points each)

• Trigonometric formulas (2 questions, 4 points each)

• Likelihood (3 points)

EXAMPLE

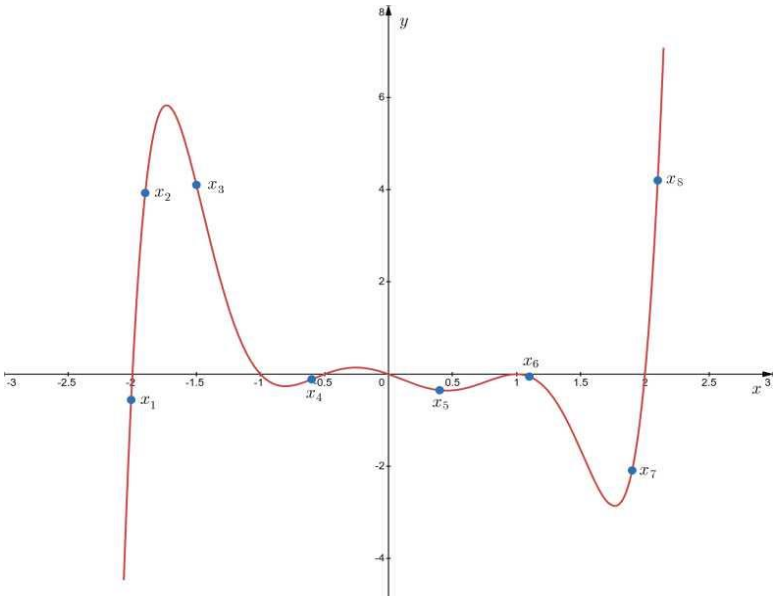
1. Find the domain of the function

$$y = \frac{\sqrt{1+x}}{\sqrt{4-x}}$$

2. Factorize:

$$xy + 4x + 2y + 8$$

3. The figure shows a graph of $y = f'(x)$ – the derivative of the function $f(x)$. Eight points are marked on the x-axis: $x_1, x_2\ x_3\ x_4\ x_5\ x_6\ x_7\ x_8$. How many of these points belong to the intervals of increasing the function $f(x)$?



4. John, Yan, and Mary are painters. John and Yan together will paint one wall in 40 minutes, John and Mary will paint one wall in 50 minutes, and all three painters will paint 17 walls in 10 hours. How many walls will Yan and Mary paint in 10 hours?

5. Calculate sin a if $\cos\alpha = \frac{7}{25}, \frac{3\pi}{2} < \alpha < 2\pi$

6. There are 45 white balls and 5 black ones in a basket. Find the likelihood that a randomly selected ball will be black.

REFERENCES

ABRAMSON J. Algebra and Trigonometry 2e. Access for free at openstax.org