

Math Placement Test

Sample questions*

Part A (Pre-Algebra / MTG 100)

Algebraic expressions:

- **Add, subtract, multiply, and divide polynomials, and perform combined operations in order.**

1- Find the difference of $3x^2 - 2x + 1$ and $6x^2 + 4x - 9$

2- Divide $\frac{x^2 - 6x + 9}{x - 4}$

3- Simplify $1 - 2x[3 - 4x(x + 2)]$

- **Integer exponents, rational exponents, and radicals.**

4- Simplify $\left(\frac{2x^7 y^{-1}}{8x^{-4} y^3}\right)^{-2}$

5- Simplify $(x^{-3})^{2/3}$

6- Simplify $\frac{1}{\sqrt{3}} - \frac{\sqrt{12}}{3}$

- **Factor polynomials.**

7- Factor completely $24m^2n - 48m^3 + 36mn - 72m^2$

8- Factor completely $3x^3 - 3x^2 - 18x$

9- Factor completely $50x^4y^2 - 32y^6$

- **Add, subtract, multiply, and divide rational expressions, and complex fractions.**

10- Simplify $\frac{x^2 + 2x + 1}{x^2 - 1}$

11- Perform indicated operations: $1 + \frac{x^2 - 4}{2x + 6} \div \left(\frac{x + 2}{x + 3}\right)^2$

* The questions are provided as a guide to the subjects to be studied and to indicate the possible level of the test. This does not mean that the actual test must have similar questions.

12- Simplify $\frac{\frac{1}{y} + \frac{2}{x}}{\frac{1}{2y} - \frac{1}{x}}$

Equations and inequities in one variable:

- **Solve linear, quadratic, and rational equations and inequalities, and lateral equations.**

13- Solve the equation: $5x + 9 = 3x - 7$

14- Solve for the variable **t** in terms of A, P and r: $A = P + Prt$

15- Solve the inequality $-\frac{5}{8}(x - 2) \geq 1$

16- Solve the equation $2x^2 - 3 = x$

17- Solve the inequality $\frac{3-x}{x+1} \leq 3$

Equations and inequalities in two variables:

- **Graph lines and parabolas and calculate their properties (Slope, Intercepts, Vertex... etc.)**

18- Complete the ordered pairs so that each is a solution for the equation: $3x - 2y = 4$

$(-4, ?), (?, 4)$

19- Find the slope m, and y-intercept b, of the line. $4x - 2y = 8$

20- Write the equation of the line through the two points $(-2, 3), (4, 5)$

21- Find the equation of the axis of symmetry, x-intercepts, y-intercept, coordinates of the vertex and graph the parabola $y = x^2 - 6x + 8$

- **Solve two linear equations in two variables**

22- Solve the following system of equations

$3x - y = 21$

$3x + y = 15$

- **Graph linear inequalities in two variables and solve systems of linear inequalities.**

23- Solve the following system of linear inequalities by graphing

$$x + y > 4$$

$$x - y < 2$$

Applications and word problems

- **Number problems.**

24- Find an integer such that if 10 is added to the integer's square, the result is 40 more than that integer.

25- Find two consecutive odd integers such that 3 times first integer is 5 more than twice the second

- **Geometry problems.**

26- Suppose that the circumference of a circular swimming pool is 88 ft. Find the diameter of the pool

27- The length of a rectangle is 3 cm more than twice its width. If the perimeter of the rectangle is 36 cm, find the dimensions of the rectangle.

28- The area of a rectangle is 150 m^2 . If the length of the rectangle is 5 meters more than its width, what is the perimeter of the rectangle?

Sample Questions for Part B is also attached