COLLEGE OF SCIENCE, TECHNOLOGY AND APPLIED ARTS OF TRINIDAD AND TOBAGO

COSTAATT

MATHEMATICS PLACEMENT TEST

GENERAL GUIDELINES

This is a sample of the Mathematics Placement Test for students entering COSTAATT. The primary purpose of the placement test is to place the student in the appropriate developmental mathematics course.

There are three developmental mathematics courses offered at COSTAATT. The modules for these courses are as follows:

COURSES	MODULE 1	MODULE 2	MODULE 3
MATH 091	Real Number System • Real numbers & properties • Whole numbers • No. Theory • Fractions- Multiplication & Division Assessment # 1	Fractions, Decimals, Ratio & Proportion & Measurement • Fractions- Add & Subtraction • Decimals • Ratio & Proportion • Measurement Assessment # 2	Percent & Statistics • Percent • Percent & Application • Statistics- interpreting and constructing graphs • Statistics- frequency distributions Assessment # 3
MATH 092	Expressions, Equations & Applications & Graphing • Algebraic Expressions • Equations • Manipulating formulae • Graphing Assessment # 1	Graphs of linear equations in 2 variables & Inequalities • Gradients • Slope/Intercept • Systems of linear equations & inequalities • Inequalities Assessment # 2	Linear inequalities, Set Theory & Inductive/Deductive Reasoning • Graphing linear inequalities • Set Theory • Intersection of 2 and 3 sets • Inductive/Deductive Reasoning Assessment # 3
MATH 093	Exponents, Radicals & Scientific Notation, and Functions & Relations. • Exponents • Application of exponents- Scientific Notation • Roots & Radicals • Relations, Functions & Graphs Assessment # 1	Polynomials, Factoring & Applications & Quadratic Functions • Polynomials • Factoring & Applications • Quadratic Equations- Factoring & Formula • Quadratic Equations- Square root property & completing the square • Graph quadratic functions • Assessment # 2	Rational Expressions & Equations & Matrices • Rational Expressions- simplification; multiplication & division • Rational Expressions/Equations- Addition & subtraction • Matrices Assessment # 3

MATHEMATICS PLACEMENT TEST

-THE USE OF CALCULATORS IS NOT ALLOWED.

-The Placement Test consists of sixty-five (65) multiple choice questions divided into three sections:

-The Pre-Algebra (Math 091) section consists of 24 questions divided into the modules, as indicated in the table above. A student has to get at least 75% of the questions in each module correct in order to be exempted from taking this course.

-The Basic Algebra (Math 092) section consists of 21 questions divided into the modules, as indicated in the table above. A student has to get at least 75% of the questions in each module correct in order to be exempted from taking this course.

-The Intermediate Algebra (Math 093) section consists of 20 questions divided into the modules, as indicated in the table above. A student has to get at least 75% of the questions in each module correct in order to be exempted from taking this course.

Please note that if a student fails only one module in any of the above-stated courses, this student will have the opportunity for tuition in this module during the semester. Thus the student will not have to attend classes for the entire course. However, the student will have to be evaluated in all three assessments in order to receive a final grade for the course.

THE FOLLOWING IS A SAMPLE OF QUESTIONS WHICH YOU COULD USE TO PREPARE FOR THE PLACEMENT TEST.

PRE-ALGEBRA

1. **What is the lowest common multiple (LCM) of 8, 12 and 30?**
   a) 108 b) 120 c) 240 d) 360

2. **The number 38742, rounded to 2 significant figures is:**
   (a) 39 (b) 38000 (c) 39000 (d) 38

3. **These fractions , $\frac{3}{5}$, $\frac{7}{10}$, $\frac{8}{15}$, $\frac{1}{2}$, arranged in ascending order, is:**

   (a) $\frac{1}{2}, \frac{3}{5}, \frac{7}{10}, \frac{8}{15}$ **(b)** $\frac{1}{2}, \frac{8}{15}, \frac{3}{5}, \frac{7}{10}$ **(c)** $\frac{7}{10}, \frac{3}{5}, \frac{8}{15}, \frac{1}{2}$ **(d)** $\frac{8}{15}, \frac{7}{10}, \frac{3}{5}, \frac{1}{2}$

4. **Calculate:** $8\frac{1}{3} \times \left(4\frac{8}{10} \div 96\right)$
   a) $\frac{4}{5}$ **b)** $\frac{1}{20}$ **c)** $\frac{2}{5}$ **d)** $\frac{5}{12}$

5. **7.2 x 0.06 is equal to**
   (a) 0.432 (b) 4.32 (c) 43.2 (d) 0.0432

6. **The ratio 30 minutes : 2 hours, written as a fraction in its lowest terms, is:**
   (a) 15 : 1 (b) 30 : 2 (c) 1 : 4 (d) 30 : 120

7. **0.91 metres is the same as**
   (a) 91millimetres (b) 910 millimetres (c) 9.1 millimetres (d) 9100 millimetres

8. **Three-quarters of the students in a Pre-Algebra course passed. If there were 60 students in the course, how many students did not pass?**
   a) 15 b) 30 c) 45 d) 60

9. **A survey of COSTAATT students at the City Campus shows that 3 out of 7 students have pies for breakfast. Of the students who have pies for breakfast 2 out of 3 have hot sauce in the pies. How many of the 1400 students at City Campus have hot sauce in their pies?**
   a) 600 b) 400 c) 300 d) 200

10. **A wardrobe costs $2,000.00 to build. Because it had a flaw it was sold for $900. Calculate the loss per cent.**
    a) 55 b) 122 c) 222 d) 1100

BASIC ALGEBRA

1. **If x = 1 and y = - 2, evaluate $3x^3y - 2xy^2$**

a) -2 b) -7 c) -14 d) 2

2. **If $2x - 3 = 11$, then the value of x is**

(a) 4 (b) 8 (c) 7 (d) 14

3. In which quadrant of the Cartesian plane does the point (-2, 7) lie?

a) 1st b) 2nd c) 3rd d) 4th

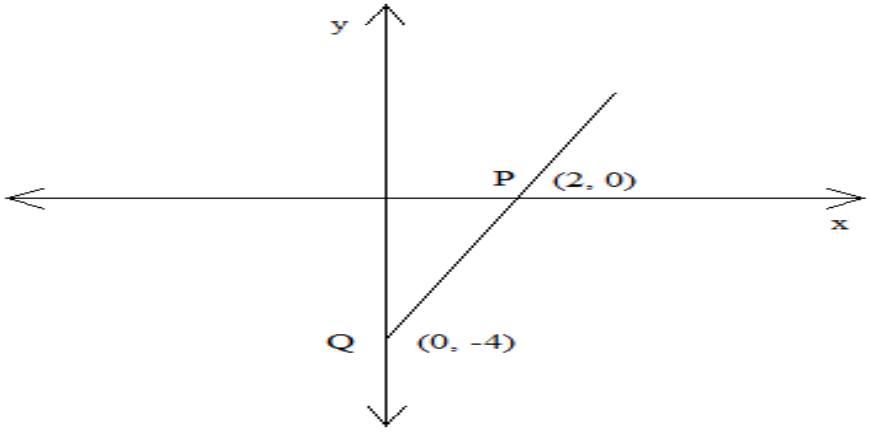
4. **If P = {multiples of 6 from 15 to 50}, then find n(P).**

a) 6 b) 7 c) 8 d) 9

5. Solve the following equations simultaneously:

2x + 3y = - 8
5x – 2y = 18

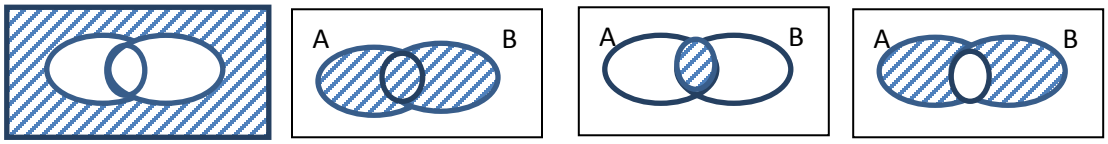
a) (-2, 4) b) (2, 4) c) (-2 , -4) d) (2, -4)



6. .In the diagram above, the 2 points P and Q lie on the line. State the coordinates of the x intercept.

a) (2 , 0) b) (0 , -4) c) (2, -4) d) (-2, 4)

7. **In which diagram is the region $(A \cup B)^1$ shaded?**



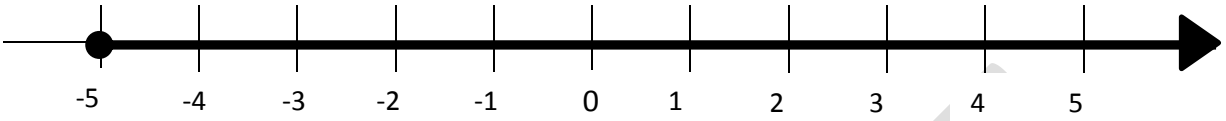
(a) (b) (c) (d)

8. **The equation of a straight line is given as $3x + y = 7$. The slope of this line is:**

(a) 3 **(b) 7** **(c) – 7** **(d) - 3**

9. Which inequality corresponds to the graph below?

(a) $x > -5$ **(b)** $x < -5$ **(c)** $x \geq -5$ **(d)** $x \leq -5$



10. The statement "*p is at most* 7" can be represented by which of the following?

(a) $p < 7$ **(b)** $p \leq 7$ **(c)** $p > 7$ **(d)** $p \geq 7$

INTERMEDIATE ALGEBRA

1. **Write a polynomial to represent the following:**
   - **First term: numerical coefficient 5 and degree of 4**
   - **Second term: numerical coefficient 7 and degree 3**
   - **Third term: constant 9**

a) $x^2 + 4x + 9$ **b)** $4x^5 + 3x^4 + 9$ **c)** $5x^4 + 7x^3 + 9$ **d)** $20x^2 + 21x + 9$

2. Which of the following is written in Scientific Notation?

(a) 3.25×10^{-1} **(b)** 32.5×10^{2} **(c)** 3.25×100^{2} **(d)** 0.325×10^{-1}

3.Simplify this expression:

$$\frac{(y)^{-4}(y)^{-3}}{y^{-20}}$$

a) y^{-21} **b)** y^{13} **c)** y^{-19} **d)** y^{-13}

4. $\frac{6m^4+2m}{2m^2}$ **when simplified, is**

(a) $\frac{8m^5}{2m^2}$ **(b)** $3m^2 + \frac{1}{m}$ **(c)** $4m^3$ **(d)** $\frac{3}{m^2} + m$

5. Solve this equation by factoring: $3x^2 + 10x - 8 = 0$

a) $\frac{2}{3}$ **or - 4** **b)** $-\frac{2}{3}$ **or 4** **c)** $\frac{3}{2}$ **or** $\frac{1}{4}$ **d)** $-\frac{3}{2}$ **or 4**

6. $(a^2 - b^{2)}$, **when factorized, is equal to**

(a) (a – b)(a – b) **(b)** (a + b)(a - b) **(c)** $(a - b)^2$ **(d)** (a + b) (a + b)

7. The expression $\frac{8a-24}{4a-12}$, **written in its lowest terms, is**

(a) $\frac{2a-6}{a-3}$ **(b)** *2a -2* **(c)** *2* **(d)** **4**

8. Given the rational expression $R = \frac{2x-4}{3x^2 - 2x-8}$.

Find the value (s) of x for which R is undefined.

a) $\frac{2}{(3x+4)}$ **b)** $\frac{2(x-2)}{(3x+4)}$ **c)** $\frac{2}{3}$ **or** $\frac{1}{2}$ **d)** $-\frac{4}{3}$ **or 2**

9. Which of the following is a 2 x 3 matrix ?

(a) **(b)** $\begin{bmatrix} 2 \\ 3 \\ 6 \end{bmatrix}$ **(c)** $\begin{bmatrix} 2 & 3 & 6 \end{bmatrix}$ **(d)** $\begin{bmatrix} 1 & 3 \\ 2 & 5 \\ 6 & 4 \end{bmatrix}$ $\begin{bmatrix} 1 & 2 & 6 \\ 3 & 5 & 4 \end{bmatrix}$

10. Given that A = $\begin{pmatrix} 4 & -3 \\ 8 & 7 \end{pmatrix}$ **and B=** $\begin{pmatrix} -1 & 2 \\ 1 & 6 \end{pmatrix}$, **evaluate A – 2B**

a) $\begin{pmatrix} -2 & 4 \\ 2 & 12 \end{pmatrix}$ **b)** $\begin{pmatrix} 3 & -1 \\ 7 & 1 \end{pmatrix}$ **c)** $\begin{pmatrix} 5 & -5 \\ 7 & 1 \end{pmatrix}$ **d)** $\begin{pmatrix} 6 & -7 \\ 6 & -5 \end{pmatrix}$

END OF SAMPLE EXAMINATION

SOLUTION SHEET

PRE-ALGEBRA

1) b 2) c 3) b 4) a 5) a 6) c 7) b 8) a 9) b 10) a

BASIC ALGEBRA

1) c 2) c 3) b 4) a 5) d 6) a 7) a 8) d 9) c 10) b

INTERMEDIATE ALGEBRA

1) c 2) a 3) b 4) b 5) a 6) b 7) c 8) d 9) d 10) d