Civil Engineering Licensure Exam – Mock Exam (Day 7: Comprehensive Math Review)

February 23, 2025

Instructions

- Time Limit: 90 Minutes
- Coverage: Algebra, Logarithms, Exponentials, Progressions, Trigonometry, Analytic Geometry, and Calculus
- Total Questions: 15 (Multiple Choice & Problem-Solving)
- Show complete solutions for problem-solving questions.

Section A: Multiple Choice Questions (MCQs)

Choose the best answer.

1. Solve for x in the equation:

$$2x^2 - 5x + 3 = 0$$

   (a) $x = 1, 3$
   (b) $x = 2, \frac{3}{2}$
   (c) $x = \frac{3}{2}, 1$
   (d) $x = -1, -3$

2. Evaluate:

$$\log_2 16$$

   (a) 2

(b) 3

(c) 4

(d) 5

3. Find the sum of the first 10 terms of an arithmetic sequence where $a = 5$ and $d = 3$.

   (a) 125

   (b) 140

   (c) 145

   (d) 150

4. Solve for x in the equation $\tan x = 1$ within $0° \leq x \leq 360°$.

   (a) $45°, 225°$

   (b) $60°, 240°$

   (c) $30°, 210°$

   (d) $90°, 270°$

5. Find the distance between the points $(1, 2)$ and $(4, 6)$.

   (a) 5

   (b) 4

   (c) $\sqrt{18}$

   (d) $\sqrt{20}$

Section B: Problem-Solving

1. Solve the system of equations:

$$3x + 2y = 12$$

$$x - y = 4$$

2. Compute:

$$\lim_{x \to 2} \frac{x^2 - 4}{x - 2}$$

3. Differentiate:

$$f(x) = x^3 - 4x^2 + 2x - 5$$

4. Find the equation of the line passing through $(2, 5)$ with slope $m = -3$.

5. Evaluate:

$$\int (3x^2 - 5x + 2)\, dx$$