Civil Engineering Licensure Exam – Mock Exam (Day 1: Algebra)

February 23, 2025

Instructions

- Time Limit: 60 Minutes
- Coverage: Equations, Inequalities, and Functions
- Total Questions: 10 (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:

$$3x - 7 = 2x + 5$$

   (a) $x = 2$
   (b) $x = 5$
   (c) $x = 12$
   (d) $x = -2$

2. Solve for x in the quadratic equation:

$$x^2 - 5x + 6 = 0$$

   (a) $x = 2, 3$
   (b) $x = -2, -3$

(c) $x = 1, 6$

(d) $x = -1, -6$

3. Which of the following represents an **exponential function**?

   (a) $f(x) = 3x + 2$

   (b) $f(x) = 2^x$

   (c) $f(x) = x^2 + 5x$

   (d) $f(x) = \log(x)$

4. If $f(x) = 4x - 7$, find $f(3)$.

   (a) 3

   (b) 5

   (c) 8

   (d) 12

5. Solve the inequality $2x + 3 < 7$.

   (a) $x < 2$

   (b) $x > 2$

   (c) $x < 3$

   (d) $x > 3$

Section B: Problem-Solving

1. Solve the system of equations:

$$2x + 3y = 12$$

$$x - y = 4$$

2. A projectile's height (in meters) at time t seconds is given by:

$$h(t) = -5t^2 + 20t + 15$$

   Find the time when the projectile reaches its maximum height.

3. Find the domain of the function:

$$f(x) = \frac{1}{x - 3}$$

4. If $g(x) = x^2 - 4x + 7$, find the vertex of the function.

5. A company's revenue function is given by:

$$R(x) = 50x - x^2$$

   Find the value of x that maximizes the revenue.