Civil Engineering Licensure Exam – Mock Exam (Day 4: Analytic Geometry)

February 23, 2025

Instructions

- Time Limit: 60 Minutes
- Coverage: Cartesian Coordinates, Straight Lines, and Conic Sections
- 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. Find the distance between the points $(3, 4)$ and $(-1, 1)$.
   (a) 4
   (b) 5
   (c) $\sqrt{25}$
   (d) $\sqrt{29}$
2. The midpoint of the line segment joining $(2, 3)$ and $(8, 7)$ is:
   (a) $(4, 5)$
   (b) $(5, 5)$
   (c) $(6, 6)$
   (d) $(5, 6)$

3. Find the slope of the line passing through the points $(4, 6)$ and $(2, 1)$.

   (a) $\frac{5}{2}$
   (b) $\frac{3}{5}$
   (c) $\frac{1}{2}$
   (d) $\frac{5}{1}$

4. The equation of a line passing through $(2, 3)$ with a slope of 4 is:

   (a) $y = 4x + 3$
   (b) $y - 3 = 4(x - 2)$
   (c) $y = 3x + 4$
   (d) $y - 2 = 4(x - 3)$

5. Identify the conic section represented by the equation:

$$x^2 + 4y^2 = 16$$

   (a) Parabola
   (b) Hyperbola
   (c) Ellipse
   (d) Circle

Section B: Problem-Solving

1. Find the equation of a line passing through the points $(5, 2)$ and $(9, 8)$.
2. A line has an equation $3x - 4y = 12$. Find the slope and the y-intercept.
3. Find the equation of a circle with center $(3, 4)$ and radius 5.
4. Find the foci of the ellipse given by the equation:

$$\frac{x^2}{25} + \frac{y^2}{9} = 1$$

5. Determine the equation of a parabola with vertex $(0, 0)$ and focus $(0, 3)$.