MPM2D – Unit 2 Test Name:_____

June 15, 2026

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Curriculum Expectations: G2/3: solve problems using analytic geometry involving properties of lines and line segments. Verify geometric properties of triangles and quadrilaterals using analytic geometry.

$m = \frac{y_2 - y_1}{x_2 - x_1}$ $y = mx + b$ $d = \sqrt{(y_2 - y_1)^2 + (x_2 - x_1)^2}$ $M\left(\frac{x_2 + x_1}{2}, \frac{y_2 + y_1}{2}\right)$

***** SHOW ALL WORK AND USE METHODS LEARNED IN CLASS. KEEP YOUR ANSWERS AS PRECISE AS POSSIBLE.*****

1. Points M $(-5, 6)$ and N $(13, -10)$ are the endpoints of a line segment. [4]
   a. Determine the length of line segment MN.
   b. Determine the midpoint of line segment MN.

2. Given a circle that has a centre at $(0, 0)$ and passes through the point $(6, -3)$: [5]
   a. Determine the radius of the circle.
   b. State the equation of the circle.
   c. Does the point $(5, -4)$ lie inside, outside or on the circle?

3. Points P $(-1, 3)$, Q $(9, 1)$, and R $(7, 5)$ are the coordinates of the vertices of a triangle. Determine the equation of the line that passes perpendicularly through the middle of side PQ. [4]

4. Classify the quadrilateral given the vertices; M $(-1, 8)$, N $(3, 9)$, O $(-5, 1)$, and P $(-4, 5)$. [5]

5. Given the coordinates of the vertices of triangle ABC, describe the steps you would follow to determine the area of the triangle. [2]