

Name: _____
Student ID: _____

Quiz 9

This quiz is graded out of 10 marks. No books, calculators, notes or cell phones are allowed. You must show all your work, the correct answer is worth 1 mark the remaining marks are given for the work. If you need more space for your answer use the back of the page.

Question 1. (5 marks) §3.3 #29 Using projections, find the distance between the point and the line.

$$(-3, 1); 4x + 3y + 4 = 0$$

Question 2. (5 marks) §3.3 #37 Using projections, find the distance between the given parallel planes.

$$2x - y - z = 5 \text{ and } -4x + 2y + 2z = 12$$

Question 3. (2 marks) Let A and B be $n \times n$ matrices, $AB = -BA$, and n is odd, show that either A or B has no inverse.

Question 4. (2 marks) Show that $||\vec{u} + \vec{v}||^2 + ||\vec{u} - \vec{v}||^2 = 2(||\vec{u}||^2 + ||\vec{v}||^2)$.

Question 5. (2 marks) Prove: If B and C are $n \times n$ matrices, $A = B^T C + C^T B$ is invertible then A^{-1} is symmetric.