

Name: \_\_\_\_\_

<p>1. (a) “ <math>x^2 + 7x + 9 &gt; 0</math> for all <math>x</math>”. <b>Disprove</b> this statement using a suitable counter-example.</p> <p>(b) Find the values of <math>k</math> such that <math>x^2 + 7x + k &gt; 0</math> for all <math>x</math></p>	
<p>2. The line <math>l_1</math> passes through <math>(-3, 7)</math> and <math>(5, 6)</math>. The line <math>l_2</math> is <math>5x - 3y = 1</math>. The line <math>l_3</math> is tangent to <math>y = x^2</math> at <math>x = 4</math>.</p> <p>Determine whether the lines (i) <math>l_1</math> and <math>l_2</math> (ii) <math>l_1</math> and <math>l_3</math> (iii) <math>l_2</math> and <math>l_3</math> are parallel, perpendicular or neither.</p>	
<p>3. Find a unit vector in the direction of <math>AB</math> given that <math>A</math> and <math>B</math> have position vectors <math>5\mathbf{i} - 3\mathbf{j}</math> and <math>9\mathbf{i}</math> respectively.</p>	
<p>4. Solve the equation <math>5^{x+1} = 7</math></p>	