

1. Find an equation of the sphere which has as a diameter the line segment from  $(-3, 2, -1)$  to  $(-1, 6, 3)$ . *(5 points)*

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2. Let  $\mathbf{a} = (1, 3, -4)$  and  $\mathbf{b} = (2, -1, 1)$ . Compute  $\text{proj}_{\mathbf{b}} \mathbf{a}$  and  $\text{comp}_{\mathbf{b}} \mathbf{a}$ . *(5 points)*

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3. Find all vectors of norm 2 which are parallel to the vector  $2\mathbf{i} + \mathbf{j} - 2\mathbf{k}$ . *(5 points)*

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4. Use the cross product to find the area of the triangle in 3-space having vertices  $(1, 1, 2)$ ,  $(2, 3, 4)$ , and  $(5, 2, -2)$ . *(5 points)*