Each problem is worth 5 points. Clear and complete justification is required for full credit.

1. Find 
$$\left(-\vec{i} + 2\vec{j} - 4\vec{k}\right) \cdot \left(2\vec{i} + 3\vec{k}\right)$$
.

2. Find 
$$\left(-\vec{i} + 2\vec{j} - 4\vec{k}\right) \times \left(2\vec{i} + 3\vec{k}\right)$$
.