Show all work!!! Unsupported answers might not receive full credit.

1) Find the angle between the vectors. First find the exact value and then approximate it using your calculator. [Be sure to indicate whether your answer is in degrees or radians!]

\[ \mathbf{a} = \langle 6, -2, -3 \rangle, \quad \mathbf{b} = \langle -2, 2, -1 \rangle \]

\[
\mathbf{a} \cdot \mathbf{b} = \langle 6, -2, -3 \rangle \cdot \langle -2, 2, -1 \rangle = 6(-2) + (-2)(2) + (-3)(-1) = -13
\]

\[
\| \mathbf{a} \| = \sqrt{6^2 + (-2)^2 + (-3)^2} = \sqrt{49} = 7
\]

\[
\| \mathbf{b} \| = \sqrt{(-2)^2 + 2^2 + (-1)^2} = \sqrt{9} = 3
\]

\[
\cos \theta = \frac{\mathbf{a} \cdot \mathbf{b}}{\| \mathbf{a} \| \| \mathbf{b} \|} = \frac{-13}{7 \cdot 3}
\]

\[
\theta = \cos^{-1}\left(\frac{-13}{21}\right) \text{ exact}
\]

\[
\theta \approx 2.24 \text{ radians or } 128.25^\circ \text{ approx}
\]