Calc BC Vector WS 1 Name: Block: Seat:

Recall

Magnitude	$\|\mathbf{v}\| = \sqrt{v_x^2 + v_y^2\ (+v_z^2 + \dots)}$
Dot Product	$\mathbf{v} \cdot \mathbf{w} = v_x w_x + v_y w_y\ (+v_z w_z + \dots)$
Angle between vectors	$\theta = \cos^{-1}\left(\dfrac{\mathbf{v} \cdot \mathbf{w}}{\|\mathbf{v}\|\ \|\mathbf{w}\|}\right)$

1. Find the dot product:
   (a) $\langle 3, 2\rangle \cdot \langle -2, 1\rangle$

   (b) $\langle 5, 7\rangle \cdot \langle 3, 1\rangle$

   (c) $\langle 1, 6\rangle \cdot \langle 5, 2\rangle$

2. Find the angle between $\langle 1, 6\rangle$ and $\langle 5, 2\rangle$

3. Find the limit

(a) $\lim_{t\to 2}\langle 2t, 4t^2 + t\rangle$

(b) $\lim_{t\to 0}\langle e^t, 7t\rangle$

4. Find the derivative
   (a) $\langle 7t^2, 3te^t \rangle$

   (b) $\langle 6t^3, \ln t \rangle$

5. Integrate the following

(a) $\int_2^4 \langle 2t^2, 3t \rangle \ dt$

(b) $\int_0^2 \langle 6t^3, te^{t^2} \rangle \ \text{dt}$

6. Find the vector tangent to $\langle \ln t, 3t^4 \rangle$ when $t = 1$

7. Find the vector $v(t)$ if $v'(t) = \langle 3t, 2t^2 \rangle$ and $v(0) = \langle 5, 2 \rangle$

Matthew Danielson made a video with solutions to these and is posted at www.youtube.com/watch?v=7EhAQSR3AKM