WebAssign
Hw 3 (12.3): Dot Product (Homework)

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MA 162 Spring 2012, section 321, Spring 2012
Instructor: Jonathan Montano

Current Score : 19.43 / 20 **Due :** Tuesday, January 17 2012 11:55 PM EST

The due date for this assignment is past. Your work can be viewed below, but no changes can be made.

Important! Before you view the answer key, decide whether or not you plan to request an extension. Your Instructor may *not* grant you an extension if you have viewed the answer key. Automatic extensions are not granted if you have viewed the answer key.

View Key

1. 2.22/2.22 points | Previous Answers SCalcET7 12.3.005.

Find $\mathbf{a} \cdot \mathbf{b}$.

$$\mathbf{a} = \left\langle 2, 1, \frac{1}{3} \right\rangle, \quad \mathbf{b} = \langle 6, -5, -6 \rangle$$

5 ✓

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2. 2.22/2.22 points | Previous Answers SCalcET7 12.3.008.

Find $\mathbf{a} \cdot \mathbf{b}$.

$$\mathbf{a} = 3\mathbf{i} + 4\mathbf{j} - \mathbf{k}, \quad \mathbf{b} = -5\mathbf{i} + 8\mathbf{k}$$

✓

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3. 2.22/2.22 points | Previous Answers SCalcET7 12.3.009.

Find $\mathbf{a} \cdot \mathbf{b}$.

$|\mathbf{a}| = 4, \quad |\mathbf{b}| = 9,$ the angle between $\mathbf{a}$ and $\mathbf{b}$ is $2\pi/3$

✓

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4. 2.22/2.22 points | Previous Answers SCalcET7 12.3.020.

Find the angle between the vectors. (First find an exact expression and then approximate to the

nearest degree.)

$\mathbf{a} = \mathbf{i} + 2\mathbf{j} - 2\mathbf{k}, \quad \mathbf{b} = 4\mathbf{i} - 3\mathbf{k}$

exact

approximate 48.19 ° ✓

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5. 1.65/2.22 points | Previous Answers SCalcET7 12.3.023.

Determine whether the given vectors are orthogonal, parallel, or neither.

(a) $\mathbf{a} = \langle -5, 5, 4 \rangle, \quad \mathbf{b} = \langle 9, -9, 2 \rangle$

- ○ orthogonal
- ○ parallel
- ◉ neither

✓

(b) $\mathbf{a} = \langle 6, 2 \rangle, \quad \mathbf{b} = \langle -1, 3 \rangle$

- ◉ orthogonal
- ○ parallel
- ○ neither

✓

(c) $\mathbf{a} = -\mathbf{i} + 2\mathbf{j} + 4\mathbf{k}, \quad \mathbf{b} = 2\mathbf{i} + 3\mathbf{j} - \mathbf{k}$

- ◉ orthogonal
- ○ parallel
- ○ neither

✓

(d) $\mathbf{a} = 8\mathbf{i} + 4\mathbf{j} - 4\mathbf{k}, \quad \mathbf{b} = -12\mathbf{i} - 6\mathbf{j} + 6\mathbf{k}$

- ○ orthogonal
- ○ parallel
- ◉ neither ✖

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6. 2.22/2.22 points | Previous Answers SCalcET7 12.3.033.

Find the direction cosines and direction angles of the vector. (Give the direction angles correct to the nearest degree.)

$\langle 2, 1, 4 \rangle$

cos α = ✔

cos β = ✔

cos γ = ✔

α = 64.12 ✔ °

β = 77.4 ✔ °

γ = 29.21 ✔ °

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7. 2.22/2.22 points | Previous Answers SCalcET7 12.3.041.

Find the scalar and vector projections of **b** onto **a**.

$\mathbf{a} = \langle -3, -6, -2 \rangle$, $\mathbf{b} = \langle 2, 2, 2 \rangle$

$\text{comp}_{\mathbf{a}}\mathbf{b}$ = ✔

✔

$\text{proj}_{\mathbf{a}}\mathbf{b}$ =

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8. 2.22/2.22 points | Previous Answers SCalcET7 12.3.043.

Find the scalar and vector projections of **b** onto **a**.

$$\mathbf{a} = 3\mathbf{i} - \mathbf{j} + 4\mathbf{k}, \quad \mathbf{b} = \mathbf{j} + \frac{1}{2}\mathbf{k}$$

$\text{comp}_{\mathbf{a}}\mathbf{b}$ = ✓

$\text{proj}_{\mathbf{a}}\mathbf{b}$ = ✓

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9. 2.24/2.24 points | Previous Answers SCalcET7 12.3.052.

A boat sails south with the help of a wind blowing in the direction S36°E with magnitude 500 lb. Find the work done by the wind as the boat moves 150 ft. (Round your answer to the nearest whole number.)

60676 ✓ ft-lb

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