WebAssign
Hw 4 (12.4): Cross Product (Homework)

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

Current Score : 20 / 20 **Due :** Thursday, January 19 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 12.4.001.

Find the cross product $\mathbf{a} \times \mathbf{b}$.

$\mathbf{a} = \langle 8, 0, -2 \rangle, \quad \mathbf{b} = \langle 0, 7, 0 \rangle$

Verify that it is orthogonal to both **a** and **b**.

$(\mathbf{a} \times \mathbf{b}) \cdot \mathbf{a} = 0$

$(\mathbf{a} \times \mathbf{b}) \cdot \mathbf{b} = 0$

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2. 2.22/2.22 points | Previous Answers SCalcET7 12.4.004.

Find the cross product $\mathbf{a} \times \mathbf{b}$.

$\mathbf{a} = \mathbf{j} + 9\mathbf{k}, \quad \mathbf{b} = 5\mathbf{i} - \mathbf{j} + 3\mathbf{k}$

Verify that it is orthogonal to both **a** and **b**.

$(\mathbf{a} \times \mathbf{b}) \cdot \mathbf{a} = 0$

$(\mathbf{a} \times \mathbf{b}) \cdot \mathbf{b} = 0$

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3. 2.22/2.22 points | Previous Answers SCalcET7 12.4.005.

Find the cross product $\mathbf{a} \times \mathbf{b}$.

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

Verify that it is orthogonal to both **a** and **b**.

$(\mathbf{a} \times \mathbf{b}) \cdot \mathbf{a} = 0$

$(\mathbf{a} \times \mathbf{b}) \cdot \mathbf{b} = 0$

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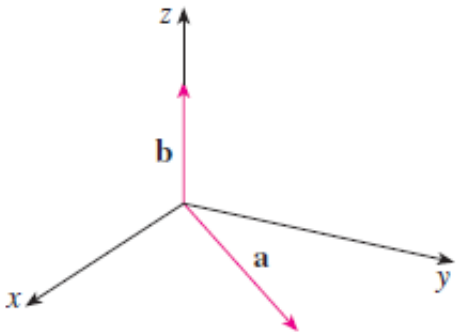
4. 2.22/2.22 points | Previous Answers SCalcET7 12.4.016.

The figure shows a vector **a** in the *xy*-plane and a vector **b** in the direction of **k**. Their lengths are $|\mathbf{a}| = 3$ and $|\mathbf{b}| = 4$.



(a) Find $|\mathbf{a} \times \mathbf{b}|$.

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(b) Use the right-hand rule to decide whether the components of **a** × **b** are positive, negative, or 0.

x-component: positive

y-component: negative

z-component: 0

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5. 2.22/2.22 points | Previous Answers SCalcET7 12.4.017.

If $\mathbf{a} = \langle 2, -1, 2 \rangle$ and $\mathbf{b} = \langle 8, 2, 1 \rangle$, find the following.

$\mathbf{a} \times \mathbf{b} =$

$\mathbf{b} \times \mathbf{a} =$

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6. 2.22/2.22 points | Previous Answers SCalcET7 12.4.019.

Find two unit vectors orthogonal to both $\langle 9, 7, 1 \rangle$ and $\langle -1, 1, 0 \rangle$.

(smaller **i**-value)

(larger **i**-value)

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7. 2.22/2.22 points | Previous Answers SCalcET7 12.4.027.

Find the area of the parallelogram with vertices $A(-2, 2)$, $B(0, 5)$, $C(4, 3)$, and $D(2, 0)$.

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8. 2.22/2.22 points | Previous Answers SCalcET7 12.4.032.

Consider the points below.

$P(-1, 3, 1)$, $Q(0, 5, 2)$, $R(3, 2, -1)$

(a) Find a nonzero vector orthogonal to the plane through the points P, Q, and R.

(b) Find the area of the triangle PQR.

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9. 2.24/2.24 points | Previous Answers SCalcET7 12.4.033.

Find the volume of the parallelepiped determined by the vectors **a**, **b**, and **c**.

$\mathbf{a} = \langle 1, 2, 4 \rangle$, $\mathbf{b} = \langle -1, 1, 5 \rangle$, $\mathbf{c} = \langle 5, 1, 4 \rangle$

33 cubic units

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