Appendix J.2 Hmwk - The Dot Product (Homework)

INSTRUCTOR
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Past Due **Due Date:** SUN, JAN 25, 2026 11:59 PM CST

Current Score: 19 / 20 POINTS | 95.0 %

Due date has passed. No changes can be made without an approved extension request.
You may not be granted an extension if you have already viewed the answer key.

VIEW ANSWER KEY

Scoring and Assignment Information

QUESTION	1	2	3	4	5	6	7	8	9	10
POINTS	1 / 1	2 / 2	0 / 1	4 / 4	2 / 2	4 / 4	1 / 1	1 / 1	2 / 2	2 / 2

Assignment Submission

For this assignment, you submit answers by question parts. The number of submissions remaining for each question part only changes if you submit or change the answer.

Assignment Scoring

Your best submission for each question part is used for your score.

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1. **[1 / 1 Points]**

DETAILS | MY NOTES | PREVIOUS ANSWERS | ASK YOUR TEACHER | PRACTICE ANOTHER

SCalcET9 12.3.008.

Find **a** · **b**.

a = 4**i** + 5**j** − **k**, **b** = −2**i** + 9**k**

$$−17

✔ Fantastic job!

Resources

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2. **[2 / 2 Points]**

DETAILS | MY NOTES | PREVIOUS ANSWERS | ASK YOUR TEACHER | PRACTICE ANOTHER

SCalcET9 12.3.016.

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

a = **i** − 5**j**, **b** = −5**i** + 12**j**

exact $$*cos*−1(−65√26√169)

✔ That's great!

approximate 169 ✔ °

Resources

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3. **[0 / 1 Points]**

DETAILS | MY NOTES | PREVIOUS ANSWERS | ASK YOUR TEACHER

PRACTICE ANOTHER

SCalcET9 12.3.027.

Find a unit vector that is orthogonal to both **i** + **j** and **i** + **k**.

$$1√3i−1√3j+1√3k

✗

Check the plus and minus signs of all terms and/or values.

Resources

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4. **[4 / 4 Points]**

DETAILS | MY NOTES | PREVIOUS ANSWERS | ASK YOUR TEACHER | PRACTICE ANOTHER

SCalcET9 12.3.025.EP.

Consider the triangle with vertices $P(0, -1, 0)$, $Q(1, 2, -2)$, and $R(5, 0, -3)$.

Determine the following vectors.

$\overrightarrow{QP}$ = $$⟨−1,−3,2⟩

✔ Amazing work.

$\overrightarrow{QR}$ = $$⟨4,−2,−1⟩

✔ Amazing job.

Find $\overrightarrow{QP} \cdot \overrightarrow{QR}$.

$\overrightarrow{QP} \cdot \overrightarrow{QR}$ = 0 ✔ Nicely done.

Is the given triangle right-angled?

- (●) Yes, it is right-angled. ✔
- ( ) No, it is not right-angled.

Good work.

Resources

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5. **[2 / 2 Points]**

DETAILS | MY NOTES | PREVIOUS ANSWERS | ASK YOUR TEACHER

PRACTICE ANOTHER

SCalcET9 12.3.020.

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

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

exact $$\arccos\left(\frac{23}{\sqrt{5}}\right)$$

✔ Nice work!

approximate 73 ✔ °

Resources

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6. **[4 / 4 Points]**

DETAILS | MY NOTES | PREVIOUS ANSWERS | ASK YOUR TEACHER | PRACTICE ANOTHER

SCalcET9 12.3.023.

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

(a) $\mathbf{a} = \langle 9, 6 \rangle$, $\mathbf{b} = \langle -4, 6 \rangle$

- (●) orthogonal
- ( ) parallel
- ( ) neither

✓

Good job.

(b) $\mathbf{a} = \langle 8, 7, -2 \rangle$, $\mathbf{b} = \langle 3, -1, 7 \rangle$

- ( ) orthogonal
- ( ) parallel
- (●) neither

✓

Impressive work.

(c) $\mathbf{a} = -12\mathbf{i} + 4\mathbf{j} + 8\mathbf{k}$, $\mathbf{b} = 9\mathbf{i} - 3\mathbf{j} - 6\mathbf{k}$

- ( ) orthogonal
- (●) parallel
- ( ) neither

✓

Nicely done.

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

- (●) orthogonal
- ( ) parallel
- ( ) neither

✓

Nice!

Resources

Read It

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7. **[1 / 1 Points]**

DETAILS | MY NOTES | PREVIOUS ANSWERS | ASK YOUR TEACHER | PRACTICE ANOTHER

SCalcET9 12.3.009.

Find **a** · **b**.

|**a**| = 6, |**b**| = 4, the angle between **a** and **b** is 30°.

$$12√3

✔ You're right!

Resources

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8. **[1 / 1 Points]**

DETAILS | MY NOTES | PREVIOUS ANSWERS | ASK YOUR TEACHER | PRACTICE ANOTHER

SCalcET9 12.3.049.MI.

Find the work (in J) done by a force **F** = 4**i** − 6**j** + 9**k** that moves an object from the point (0, 10, 8) to the point (4, 12, 20) along a straight line. The distance is measured in meters and the force in newtons.

112 ✔ J

Resources

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9. **[2 / 2 Points]**

DETAILS | MY NOTES | PREVIOUS ANSWERS | ASK YOUR TEACHER | PRACTICE ANOTHER

SCalcET9 12.3.043.

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

a = 6**i** − 6**j** + **k**, **b** = 5**i** + 7**j** − **k**

scalar projection of **b** onto **a** $$−13√73

✔ Great job!

vector projection of **b** onto **a** $$⟨−7873,7873,−1373⟩

✔ Great job.

Resources

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10. **[2 / 2 Points]**

DETAILS | MY NOTES | PREVIOUS ANSWERS | ASK YOUR TEACHER | PRACTICE ANOTHER

SCalcET9 12.3.042.

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

$$\mathbf{a} = \langle -1, 4, 8 \rangle, \quad \mathbf{b} = \langle 18, 1, 2 \rangle$$

scalar projection of **b** onto **a** $$29

✔ Good work.

vector projection of **b** onto **a** $$\langle -281, 881, 1681 \rangle$$

✔ Amazing work.

Resources

Read It

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