

University of Delaware
Department of Mathematical Sciences

MATH-243 – Analytical Geometry and Calculus C

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Spring 2012

Homework 2

Name: _____ **Section:** _____

Due date: February 14, 2012 (Section 50)
February 13, 2012 (Section 51)

Problems

Taken or adapted from Section 12.2 of the book *Calculus: Early Transcendentals* 7th edition by J. Stewart. Each exercise is worth 10 points for a total of 100 points.

1. Exercise # 12.2–2. What is the relationship between the point $(4, 7)$ and the vector $\langle 4, 7 \rangle$? Illustrate with a sketch.
2. Exercise # 12.2–10. Given $A(-4, -1)$ and $B(1, 2)$, find a vector \vec{a} with representation given by the directed line segment \overrightarrow{AB} . Draw \overrightarrow{AB} and the equivalent representation starting at the origin.
3. Exercise # 12.2–17. Find the sum of the vectors $\langle 3, 0, 1 \rangle$ and $\langle 0, 8, 0 \rangle$ and illustrate geometrically.
4. Exercise # 12.2–18. Find the sum of the vectors $\langle 1, 3, -2 \rangle$ and $\langle 0, 0, 6 \rangle$ and illustrate geometrically.
5. Exercise # 12.2–20. Given $\vec{a} = 4\hat{i} + \hat{j}$ and $\vec{b} = \hat{i} - 2\hat{j}$, find $\vec{a} + \vec{b}$, $2\vec{a} + 3\vec{b}$, $|\vec{a}|$ and $|\vec{a} - \vec{b}|$.
6. Exercise # 12.2–21. Given $\vec{a} = \hat{i} + 2\hat{j} - 3\hat{k}$ and $\vec{b} = -2\hat{i} - \hat{j} + 5\hat{k}$, find $\vec{a} + \vec{b}$, $2\vec{a} + 3\vec{b}$, $|\vec{a}|$ and $|\vec{a} - \vec{b}|$.
7. Exercise # 12.2–23. Find a unit vector that has the same direction as the vector $-3\hat{i} + 7\hat{j}$.
8. Exercise # 12.2–25. Normalize the vector $8\hat{i} - \hat{j} + 4\hat{k}$.
9. Exercise # 12.2–26. Find a vector that has the same direction as $\langle -2, 4, 2 \rangle$ but has length 6.
10. Exercise # 12.2–38. The tension \vec{T} at each end of the chain has magnitude 25 N (see Figure 1). What is the weight of the chain?



Figure 1: Problem 10