Mei Qin Chen

WeBWorK assignment number Homework1 is due: 08/30/2011 at 09:30am EDT.

The
(* replace with url for the course home page *)
for the course contains the syllabus, grading policy and other information.

This file is /conf/snippets/setHeader.pg you can use it as a model for creating files which introduce each problem set.

The primary purpose of WeBWorK is to let you know that you are getting the correct answer or to alert you if you are making some kind of mistake. Usually you can attempt a problem as many times as you want before the due date. However, if you are having trouble figuring out your error, you should consult the book, or ask a fellow student, one of the TA’s or your professor for help. Don’t spend a lot of time guessing – it’s not very efficient or effective.

Give 4 or 5 significant digits for (floating point) numerical answers. For most problems when entering numerical answers, you can if you wish enter elementary expressions such as $2^3$ instead of 8, $\sin(3 \times \pi/2)$ instead of -1, $e \times (\ln(2))$ instead of 2, $(2 + \tan(3)) \times (4 - \sin(5)) \times 6 - 7/8$ instead of 27620.3413, etc. Here’s the list of the functions which WeBWorK understands.

You can use the Feedback button on each problem page to send e-mail to the professors.

1. (1 pt) Library/Union/setMVvectors/vectors-3a.pg
Suppose $\mathbf{u} = \langle 1, 0 \rangle$ and $\mathbf{v} = \langle -2, 4 \rangle$. Then:

\[
\begin{align*}
\mathbf{u} + \mathbf{v} &= \phantom{-} \quad \\
\mathbf{u} - \mathbf{v} &= \phantom{-} \\
\mathbf{v} - \mathbf{u} &= \phantom{-} \\
7\mathbf{u} &= \phantom{-} \\
-\frac{1}{6}\mathbf{v} &= \phantom{-} \\
5\mathbf{u} - 6\mathbf{v} &= \phantom{-}
\end{align*}
\]

Correct Answers:
- $<1,4>$
- $<-3,4>$
- $<7,0>$
- $<0.333333,-0.666667>$
- $<-1,4>$

2. (1 pt) Library/FortLewis/Calc3/13-1-Displacement-vectors/HGM4-13-1-30-Displacement-vectors/HGM4-13-1-30-Displacement-vectors.pg

The figure shows a rectangular box in three-dimensional space that contains several vectors. (The vector $\mathbf{c}$ is in the xz-plane, and the vector $\mathbf{e}$ is in the xy-plane.)

Are the following statements true or false?

- $d = g - c$
- $a = -b$
- $c = f$
- $a = d$
- $e = a - b$
- $g = f + a$

3. (1 pt) Library/Union/setMVvectors/an12_2_17.pg
Find unit vectors that satisfy the given conditions:

1. The unit vector in the same direction as $\langle 3, 2 \rangle$ is

2. The unit vector oppositely directed to $-3i + j$ is

3. The unit vector that has the same direction as the vector from the point $A = (5, -4)$ to the point $B = (0, -7)$ is

Correct Answers:
- $<0.83205,0.5547>$
4. (1 pt) Library/Union/setMVvectors/an12_2.19.pg
Find vectors that satisfy the given conditions:
(1) The vector in the opposite direction to \( \mathbf{u} = \langle 4, 1 \rangle \) and of half its length is __________.

(2) The vector of length 2 and in the same direction as \( \mathbf{v} = \langle 1, 4, 1 \rangle \) is __________.

Correct Answers:
- \(-2, -0.5\)
- \(0.471405, 1.88562, 0.471405\)

5. (1 pt) Library/Dartmouth/setStewartCh13S2/problem_1.pg
Let \( \mathbf{a} = \langle 1, 2, 0 \rangle \) and \( \mathbf{b} = \langle 3, 0, 4 \rangle \).
Compute:
\[
\mathbf{a} + \mathbf{b} = ( \quad \quad \quad )
\]
\[
\mathbf{a} - \mathbf{b} = ( \quad \quad \quad )
\]
\[
2\mathbf{a} = ( \quad \quad \quad )
\]
\[
3\mathbf{a} + 4\mathbf{b} = ( \quad \quad \quad )
\]
\[
|\mathbf{a}| = \quad \quad \quad
\]

Correct Answers:
- 4
- 2
- 4
- -2
- 2
- -4
- 2
- 4
- 0

6. (1 pt) Library/Rochester/setVectors1space3D/UR_VC_1.5.pg
Find the center and radius of the sphere:
\[
x^2 - 18x + y^2 - 20y + z^2 + 20z = -245
\]
Center: (___, ___, ___)
Radius: ___

Correct Answers:
- 9
- 10
- -10
- 6

7. (1 pt) Library/Union/setMVvectors/an12_2.27.pg
Let \( \mathbf{u} = \langle 3, 4 \rangle \), \( \mathbf{v} = \langle -1, 1 \rangle \), and \( \mathbf{w} = \langle -3, 2 \rangle \). Find the vector \( \mathbf{x} \) that satisfies
\[
10\mathbf{u} - \mathbf{v} + \mathbf{x} = 8\mathbf{x} + \mathbf{w}.
\]
In this case, \( \mathbf{x} = \quad \quad \quad \quad \).

Correct Answers:
- \langle 4.85714, 5.28571 \rangle

8. (1 pt) Library/Union/setMVvectors/vectors-5b.pg
For what values of \( t \) and \( s \) does the equality
\[
\langle 1 - t, 3s - t \rangle = \langle s + 5t, 2 + 5t \rangle
\]
hold true?
\[
t = \quad \quad \quad \quad \text{and} \quad s = \quad \quad \quad \quad
\]
At these values, the resulting vector is __________.

Correct Answers:
- 0.0416667
- 0.75
- \langle 0.958333, 2.20833 \rangle