Math 2415 - 13.2

First Name_____ Last Name _____

Lab 3

Give the equation of the described plane.

1) The plane through the point (1, -4, -5) and parallel to the yz-plane

Find the distance between points P_1 and P_2.

2) $P_1(1, -1, -2)$ and $P_2(5, -6, -5)$

Find an equation for the sphere with the given center and radius.

3) Center (-8, 10, 0), radius = 5

A) $x^2 + y^2 + z^2 + 16x - 20y = -139$

B) $x^2 + y^2 + z^2 - 16x - 20y = -139$

C) $x^2 + y^2 + z^2 + 16x + 20y = -139$

D) $x^2 + y^2 + z^2 - 16x + 20y = -139$

Find the center and radius of the sphere.

4) $x^2 + y^2 + z^2 - 18x - 10y - 6z = -15$

Give a geometric description of the set of points whose coordinates satisfy the given conditions.

5) $x^2 + y^2 + z^2 > 1$

A) All points on the surface and outside the sphere with radius 1

B) All points inside the sphere with radius 1

C) All points outside the sphere of radius 1

D) All points on the surface of the sphere and inside the sphere with radius 1

Find the position vector for the vector having initial point P and terminal point Q.

6) P = (-1, -3, 0) and Q = (4, 3, -3)

A) $v = 5i + 6j - 3k$ B) $v = 4i + 6j + 4k$ C) $v = -2i + 6j + 4k$ D) $v = -5i - 6j + 3k$

Express the vector in the form $v = v_1 i + v_2 j + v_3 k$.

7) $\overrightarrow{AB}$ if A is the point (-7, -6, -5) and B is the point (-2, -13, -2)

A) $v = 5i + 7j - 3k$ B) $v = 5i - 7j + 3k$ C) $v = 5i + 7j + 3k$ D) $v = 5i - 7j - 3k$

Solve the problem.

8) For the triangle with vertices located at A(3, 5, 5), B(5, 2, 4), and C(1, 1, 1) , find a vector from vertex C to the midpoint of side AB.

A) $\frac{1}{2}i + \frac{3}{2}j + \frac{3}{2}k$ B) $3i + \frac{5}{2}j + \frac{7}{2}k$ C) $5i + \frac{9}{2}j + \frac{11}{2}k$ D) $4i + \frac{7}{2}j + \frac{9}{2}k$

Express the vector in the form $ai + bj + ck$.

9) $2u - 6v$ if $u = \langle 1, 1, 0 \rangle$ and $v = \langle 3, 0, 1 \rangle$

A) $v = 20i + 2j - 6k$ B) $v = -16i + 2j - 6k$ C) $v = 2i + 2j - 6k$ D) $v = -16i + 8j - 6k$

Express the vector as a product of its length and direction.

10) $5i + 10j + 10k$

A) $15(i + j + k)$ B) $15(5i + 10j + 10k)$

C) $15\left(\frac{1}{45}i + \frac{2}{45}j + \frac{2}{45}k\right)$ D) $15\left(\frac{1}{3}i + \frac{2}{3}j + \frac{2}{3}k\right)$

Find the following.

11) If $v = \langle -1, 6, 0 \rangle$, find $|v|$.

Answer Key
Testname: LAB 3 - 13.2

1) $x = 1$
2) $5\sqrt{2}$
3) A
4) $C(9, 5, 3), a = 10$
5) C
6) A
7) B
8) B
9) B
10) D
11) $\sqrt{37}$