1 Vectors, Coordinates, Dimension

1. What is $(2, 4) + (9, -2)$?

1. _____

2. What is $(-1, 5, 2) - (0, -2, 5)$?

2. _____

3. What is $(4, -5, 7) + (-3, -4)$?

3. _____

4. What is the zero vector in $\mathbb{R}^5$?

4. _____

5. If $v = (5, 5, -1)$, what is $-v$?

5. _____

6. Does $(-6, -7)$ equal $(-7, -6)$?

6. _____

7. What does the equation $x = 3$ represents in $\mathbb{R}^2$? How about in $\mathbb{R}^3$?

7. _____

8. Find the equation of a line in $\mathbb{R}^2$ that passes through $(-1, 1)$ and $(1, 3)$. What is the slope of the line? What is the y-intercept?

8. _____

9. What is the equation of the circle centered at the origin and the radius 3?

9. _____

10. What is the equation of the circle centered at $(2, -1)$ and the radius 4?

10. _____

11. What is the equation of the sphere centered at $(2, -1, 3)$ and the radius 1?

11. _____

12. What is the center and the radius of the circle given by the equation $x^2 + (y+1)^2 = 16$?

12. _____

13. What is the center and the radius of the circle given by the equation $x^2 - 4x + y^2 + 6x = 12$?

13. _____

14. What is the center and the radius of the sphere given by the equation $x^2 + y^2 + z^2 = x + y + z$?

14. _____

2 Inner Products

1. What is $(2, 4) \cdot (9, -2)$?

1. _____

2. What is $(-1, 5) \cdot (0, -2)$?

2. _____

3. What is $(-1, 5, 2) \cdot (0, -2, 5)$?

3. _____

4. If you were to assign a number between 0 and π to the angle between $(-1, 5)$ and $(0, -2)$, would it be less than, equal to, or greater than $\pi/2$?

4. _____

5. If you were to assign a number between 0 and π to the angle between $(-1, 5, 2)$ and $(0, -2, 5)$, would it be less than, equal to, or greater than $\pi/2$?

5. _____