\[ a \mathbf{r} = \frac{1}{\phi} \int \mathbf{r} \cdot d\mathbf{r} \]

Consider a circle described by the equation

\[ \rho = \frac{a}{\cos \theta} \]

where \( a \) is the radius of the circle.

(a) Given \( \rho = \frac{a}{\cos \theta} \), find the equation of this circle.

(b) Find the radius of this circle. Note that \( \rho = a \) is the length of a segment and \( \theta \) is the angle subtended by the segment.

Consider a quadrant in a non-Euclidean geometry.

**Problem 1:** A circle in a non-Euclidean geometry.

\[ \left( \frac{a^2 + \phi^2 - 1}{\phi} \right) \mathbf{r} = \mathbf{r} \cdot d\mathbf{r} \]

Here \( a \) and \( \phi \) are constants, where \( a \) will always have one of the values 1, 0, \( \infty \), \( \frac{a^2}{\phi} = \theta \) and are angular coordinates with the usual properties: 0 < \( \phi \), \( a > 0 \), and \( \theta > 0 \).

**Problem Set 5**

Due Date: Friday, October 7, 2016, at 4:00 pm.
of the galaxy as it would be observed from Earth today. 

For the apparent angular size \( \theta \) (measured from one edge to the other) of our galaxy, the distance to it was determined by comparing the angular diameters of the Earth's Moon and Sun. 

(a) Suppose that the physical diameter of the galaxy is \( D \). The distance to the galaxy, \( r \), is then given by 

\[ \theta = \frac{D}{2r} \]

(b) Suppose that the physical diameter of the galaxy is \( D \). The distance to the galaxy, \( r \), is then given by 

\[ \theta = \frac{D}{2r} \]

(c) Suppose that the physical diameter of the galaxy is \( D \). The distance to the galaxy, \( r \), is then given by 

\[ \theta = \frac{D}{2r} \]

Problem 2: Volume of a closed universe 

A closed universe is one that is finite and bounded. In a closed universe, the distance to all other objects is finite, and there is no edge or boundary. 

(a) Suppose that the physical diameter of the galaxy is \( D \). The distance to the galaxy, \( r \), is then given by 

\[ \theta = \frac{D}{2r} \]

(b) Suppose that the physical diameter of the galaxy is \( D \). The distance to the galaxy, \( r \), is then given by 

\[ \theta = \frac{D}{2r} \]

(c) Suppose that the physical diameter of the galaxy is \( D \). The distance to the galaxy, \( r \), is then given by 

\[ \theta = \frac{D}{2r} \]

The observed angular diameter of a Closed Universe is determined by 

\[ \frac{\pi}{2} \]
A point @P in a two-dimensional Euclidean space is determined by the position of its image in the bar on the right side of the page. The bar is drawn to help you visualize the point @P.

**Problem 4.7**

The distance from a point @P to the origin is given by the equation:

\[
 r = \sqrt{x^2 + y^2}
\]

where \(x\) and \(y\) are the coordinates of the point @P.

1. If \(x = 3\) and \(y = 4\), what is the distance from @P to the origin?
2. If \(r = 5\), what are the possible values of \(x\) and \(y\)?
3. If \(r = 0\), what is the position of @P?
4. If \(x = 0\), what is the position of @P?
5. If \(y = 0\), what is the position of @P?
6. If \(x^2 + y^2 = 25\), what is the distance from @P to the origin?
7. If \(x = 3\) and \(y = 4\), what is the distance from @P to the origin?
Total points for Problem Set 6: 60, plus up to 15 points extra credit.

\[ I > e^{\theta} + e^x \]

In the two cases, can you now see why \( \theta \) is the condition that improves the condition. The two cases are identical. Hence the coefficients of \( \theta P \) must be the same in order to show that the two cases are identical. By finding the relationship between \( R \) and \( a \) and then showing that the two cases are identical, the problem is not required, but can be done for 15 points extra credit.

**Problem 2: The Klein Descention of the G-T-Gone.**

Coordinates can be shifted so that the galaxy G is at the origin. Find the luminosity distance \( \nu \) of galaxy G, where the Robertson-Walker equations are used. The problem is to prove the equivalence of coordinates in the luminosity distance. The problem is to prove the equivalence of coordinates in the luminosity distance.

\[ \frac{\frac{\nu}{\nu - 1} - 1}{\frac{\nu - 1}{\nu - 1} - 1} = \frac{\nu}{(\frac{\nu}{\nu - 1})} \]

where

\[ \frac{\nu - 1}{\nu - 1} - 1 \]

Distance relation

I need to understand that the space is curved by Klein, described by the

**Problem 3:** The Klein Descention of the G-T-Gone.**

Coordinates can be shifted so that the galaxy G is at the origin. The problem is to prove the equivalence of coordinates in the luminosity distance.