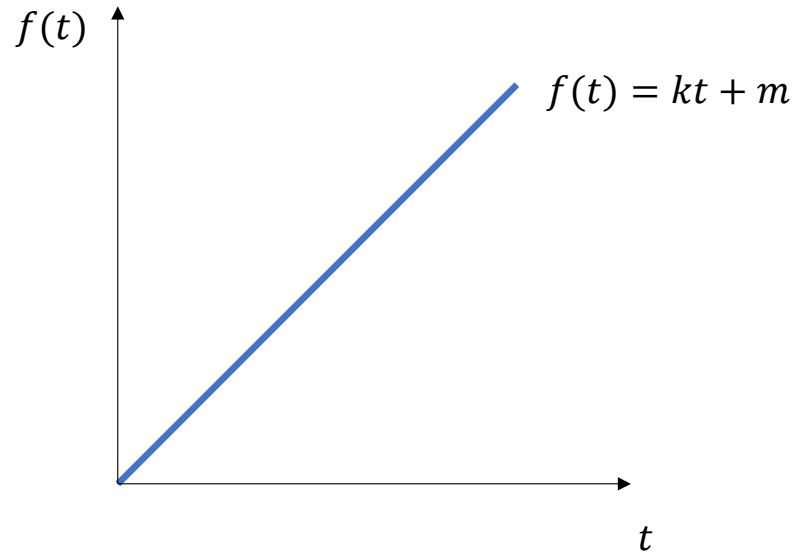
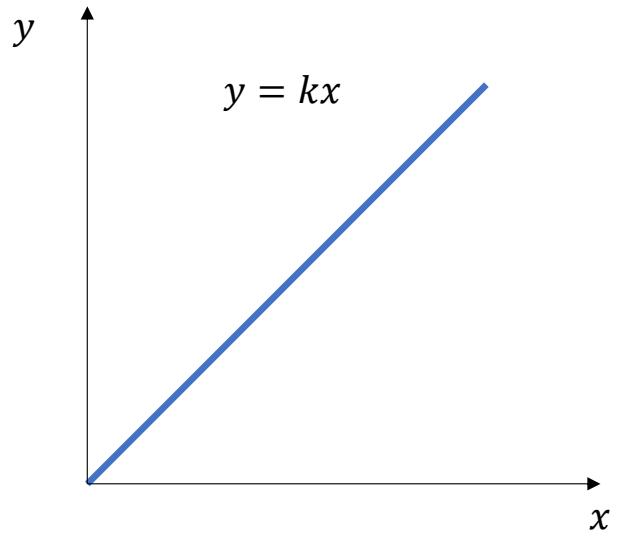


This image is a scan of a handwritten mathematical page, likely a lecture note or a study sheet. The page is filled with mathematical formulas, diagrams, and calculations. Key topics include:

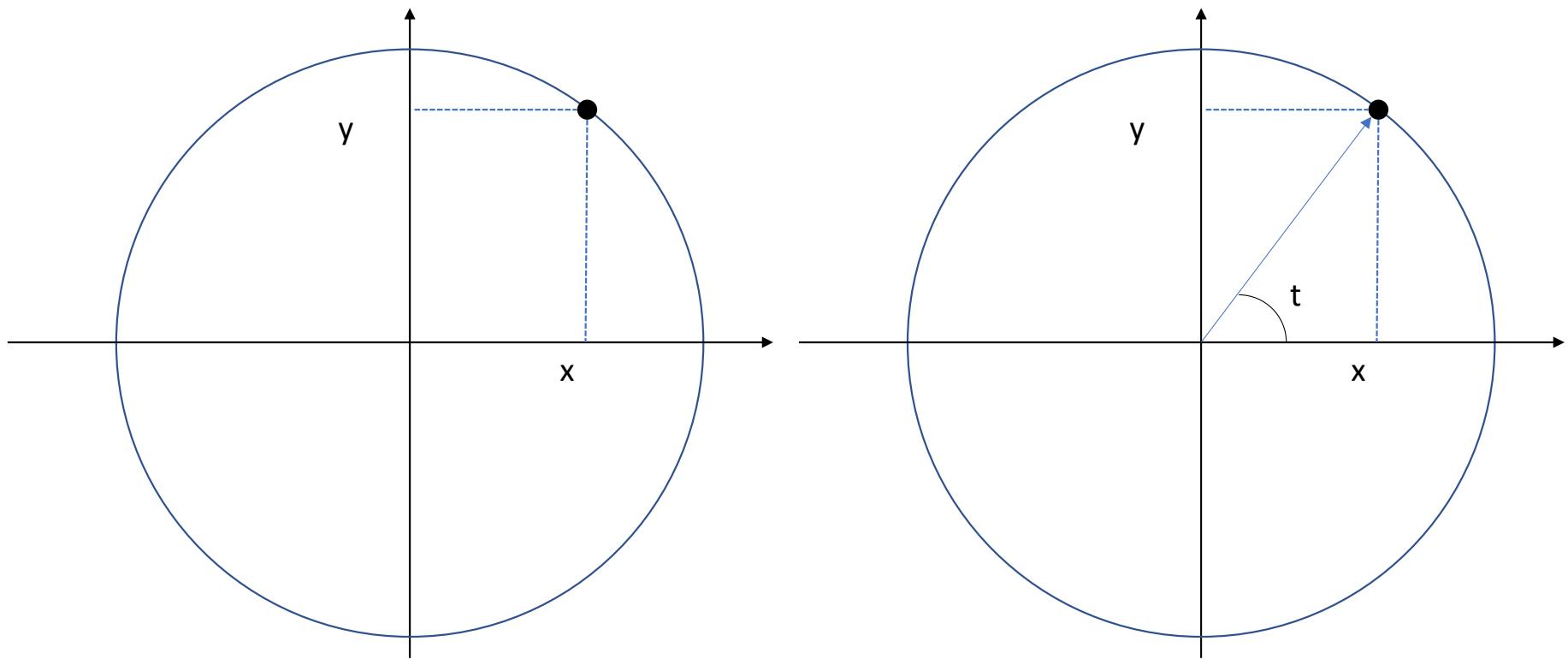
- Trigonometric identities and formulas for angles, including  $\sin^2 x + \cos^2 x = 1$ ,  $\csc^2 x + \operatorname{sech}^2 x = 1$ , and  $\operatorname{cosec}^2 x + \operatorname{csch}^2 x = 1$ .
- Geometric formulas for triangles, circles, and polygons, such as the area of a triangle ( $\frac{1}{2}ab\sin C$ ) and the formula for the sum of interior angles of a polygon ( $(n-2)\pi$ ).
- Calculus concepts like limits, derivatives, and integrals, including the definition of a derivative as  $\lim_{h \rightarrow 0} \frac{f(x_0+h) - f(x_0)}{h}$ .
- Complex numbers and their properties, including the polar form  $r(\cos \theta + i \sin \theta)$  and De Moivre's theorem.
- Hyperbolic functions and their properties, such as  $\sinh^2 x + \operatorname{sech}^2 x = 1$  and the relationship between hyperbolic and trigonometric functions.
- Logarithms and exponential functions, including the natural logarithm and its properties.
- Probability and logic, including theorems like De Morgan's laws and the law of total probability.
- Algebraic identities, such as  $a^m \times a^n = a^{m+n}$  and  $(ab)^m = a^m b^m$ .
- Geometry, including theorems like Pythagoras' theorem ( $a^2 + b^2 = c^2$ ) and the formula for the area of a trapezoid ( $\frac{1}{2}(a+b)h$ ).
- Calculus applications, including the volume of a cone ( $\frac{1}{3}\pi r^2 h$ ) and the area under a curve ( $\int_a^b f(x) dx$ ).
- Trigonometric ratios and their relationships, such as  $\tan x = \frac{\sin x}{\cos x}$  and  $\sec x = \frac{1}{\cos x}$ .
- Special functions like the error function and the incomplete gamma function.

The page is filled with numerous diagrams, including geometric shapes, graphs of functions like  $y = x^2$  and  $y = x^3$ , and coordinate systems showing points and vectors.



$$kx + y = m$$

$$\begin{aligned}x &= t, \\f(t) &= kt + m\end{aligned}$$



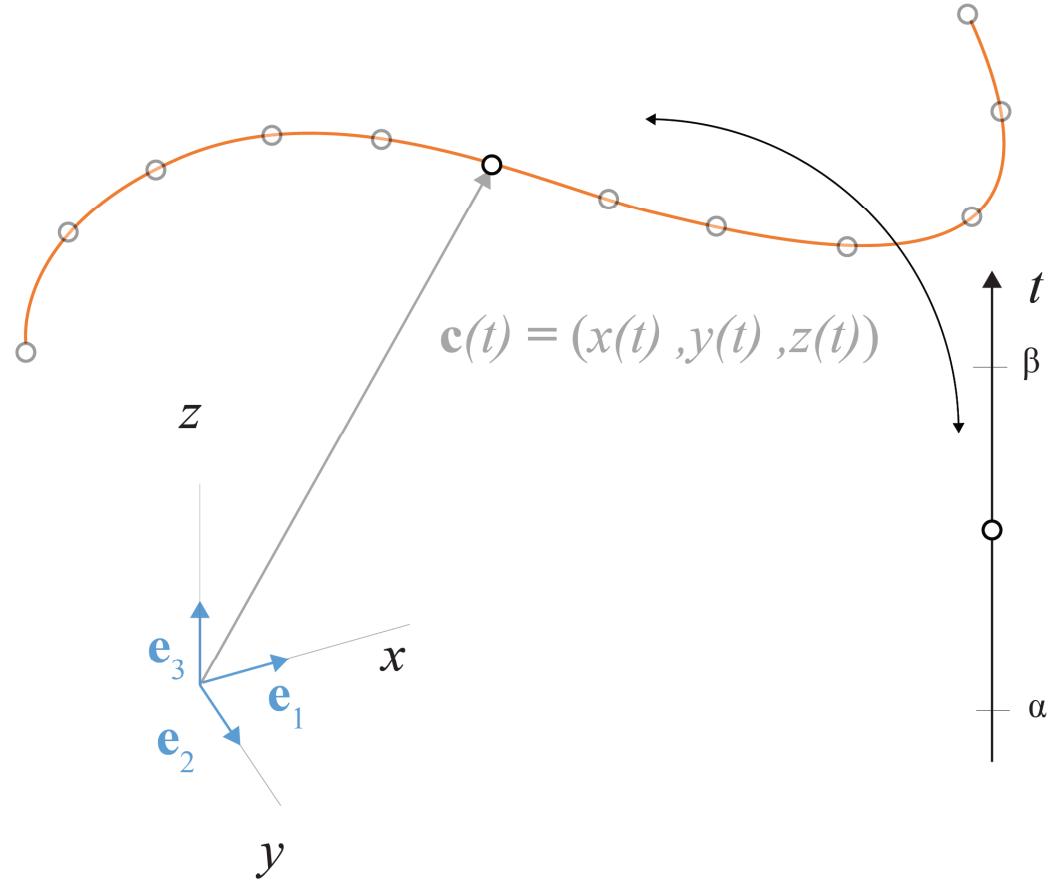
$$x^2 + y^2 = r^2$$

$$x = \pm \sqrt{r^2 + y^2}$$

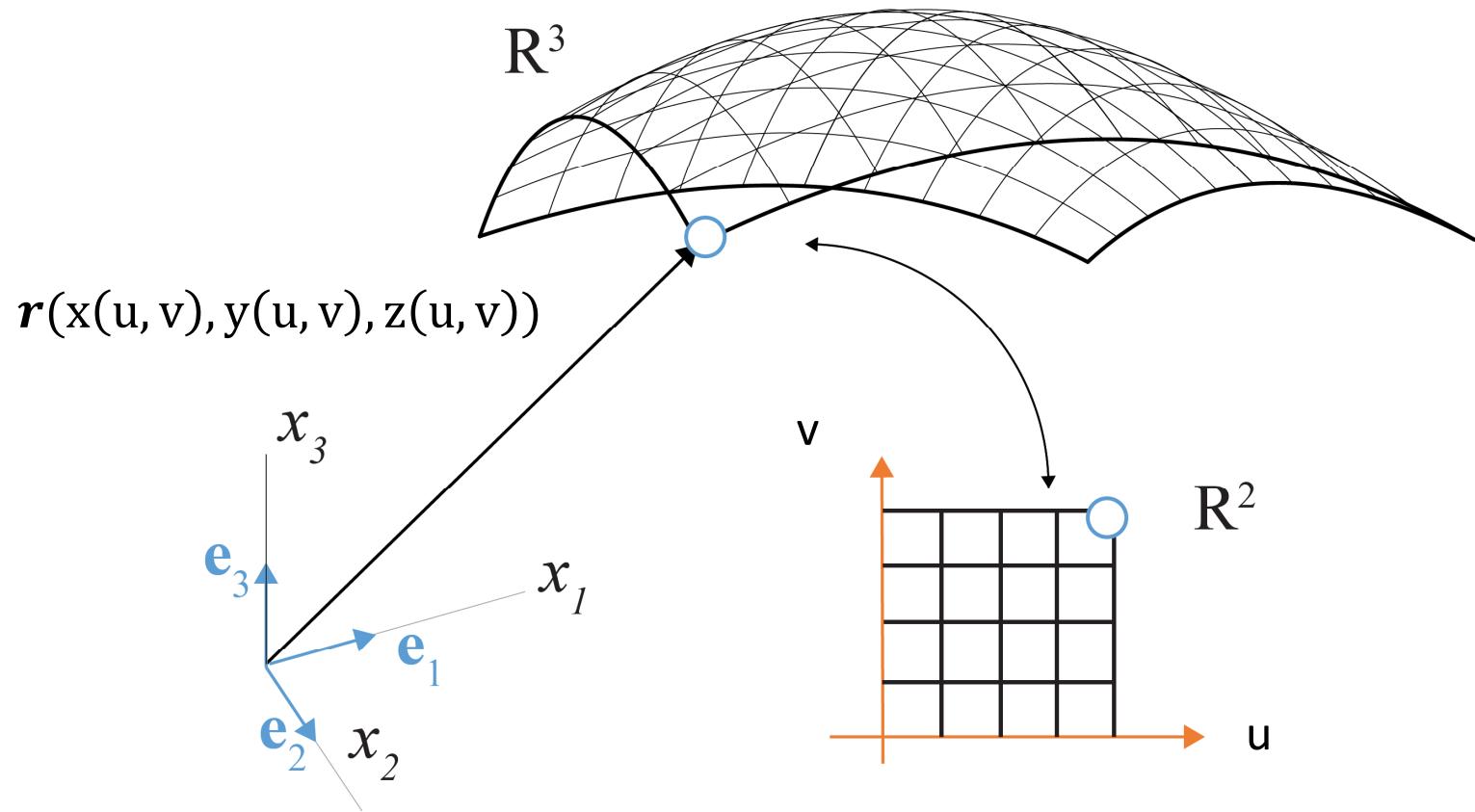
$$y = \pm \sqrt{r^2 + x^2}$$

$$x = r \cos(t) \quad y = r \sin(t)$$

$$0 \leq t \leq 2\pi$$



$$\mathbf{f}(t) = x(t)\mathbf{e}_1 + y(t)\mathbf{e}_2 + z(t)\mathbf{e}_3$$



$$\mathbf{r}(u, v) = x(u, v)\mathbf{e}_1 + y(u, v)\mathbf{e}_2 + z(u, v)\mathbf{e}_3$$