Simplify \( \left( \sqrt[3]{71} - \sqrt[3]{65} \right) \left( \sqrt[3]{5041} + \sqrt[3]{4615} + \sqrt[3]{4225} \right) \)
Find the value(s) of \( a \) such that the system of equations has no real solution.

\[
\begin{align*}
    x + 2y - 3z &= 4 \\
    3x - y + 5z &= 2 \\
    4x + y + (a^2 - 14)z &= a + 2
\end{align*}
\]
Find the value of $a$ if 
\[ \log_a(10) + \ldots + \log_a(10^n) + \ldots + \log_a(10^{10}) = 110. \]
If $\sin x + \cos x = -1$, find the value of $\sin^{2017} x + \cos^{2017} x$. 
Simplify \( \ln \left( - (i \cos 1 + \sin 1)^2 \right) \), where the natural logarithm is defined over the complex numbers and the imaginary part of the value is as close to 0 as possible.
The product of the ages of a group of teenagers is 10584000. What is the sum of their ages?
Find the distance between the vertices of $r = \frac{32}{3+5\sin \theta}$.
Find the remainder when $2^{65536}$ is divided by 13.
Find the value of\[
\cos \left( \frac{\pi}{6} \right) + \ldots + \cos \left( \frac{n\pi}{6} \right) + \ldots + \cos \left( \frac{2017\pi}{6} \right) .
\]
The coefficients of the third and eleventh terms of the expansion of \((a+b)^n\) are the same (when the terms are written in descending power of \(a\) and \(n\) is a positive integer). Find the sum of the coefficient of the fifth term and all positive integral divisors of that coefficient.
If \((a+b+c+d+e+f+g)^5\) is expanded and simplified, how many terms will contain only three letters?
Find the area enclosed by the triangle whose vertices are (1, 0, 4), (3, –3, 0), and (0, 1, 2).
A point is selected at random from inside a circle. Find the probability that the point is closer to the center of the circle than to the circle itself.