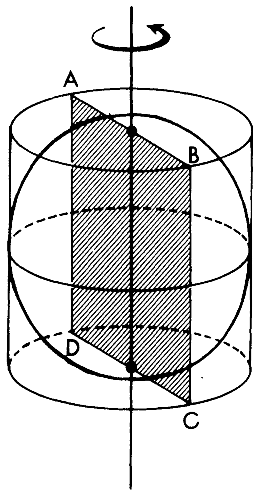
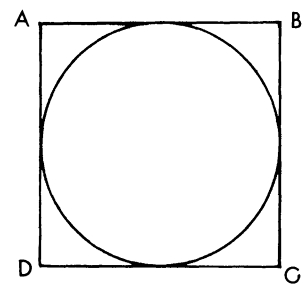
heuristically by revolving an $(n-1)$-dimensional "ball" and its "circumscribing cylinder" about an axis. Let us illustrate this with Archimedes' case $n = 3$.





Think of the sphere as made up of infinitely many copies of the circle, and the cylinder as made up of infinitely many copies of the square. For each cross section (which is actually the 2-dimensional case where $k_2 = \pi/2$ in (4)),

$$\frac{\text{area of circle}}{\text{area of square}} = \frac{\text{circumference of circle}}{\text{perimeter of square}} \left(= \pi/4\right).$$

Hence, heuristically speaking, we have in the 3-dimensional case

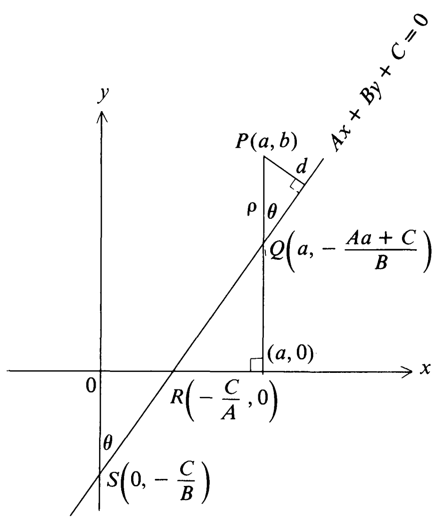
$$\frac{\text{volume of sphere}}{\text{volume of cylinder}} = \frac{\text{surface area of sphere}}{\text{surface area of cylinder}}.$$

This is the result of which Archimedes was so fond.

Distance From a Point to a Line

Abdus Sattar Gazdar, University of Garyounis, Benghazi, Libya

The figure below can be used to obtain a simple derivation of the formula for the distance between a point $P(a, b)$ and the line $Ax + By + C = 0$.



The distance between P and $Ax + By + C = 0$ is

$$d = \rho \sin\theta,$$

where ρ is the distance between P and Q. Computing $\sin\theta$ from triangle ORS, we get

$$\begin{aligned} d &= \left| b + \frac{Aa + C}{B} \right| \left(|B| / \sqrt{A^2 + B^2} \right) \\ &= \frac{|Aa + Bb + C|}{\sqrt{A^2 + B^2}}. \end{aligned}$$

Editor's Note. For ten distinctly different approaches to obtaining this distance formula, see John Staib's article "Problem-solving versus answer-finding," Two-Year College Mathematics Readings, Ed. Warren Page, MAA 1981, pp. 221–227. For Classroom Capsules on this theme, see the derivation given by K. R. Sastry [TYCMJ 12 (March 1981) 146–147] and Warren B. Gordon [TYCMJ 10 (November 1979) 348–349].

The Maximum and Minimum of Two Numbers Using the Quadratic Formula

Dan Kalman, Augustana College, Sioux Falls, SD (on leave from University of Wisconsin-Green Bay)

The maximum and minimum of two numbers, r and s, may be computed using

$$\max(r,s) = \tfrac{1}{2}(r + s + |r - s|) \tag{1}$$

$$\min(r,s) = \tfrac{1}{2}(r + s - |r - s|). \tag{2}$$

Formulas (1) and (2) are familiar to those who have studied advanced mathematics, but are not typically introduced in the first two years of college mathematics. In this