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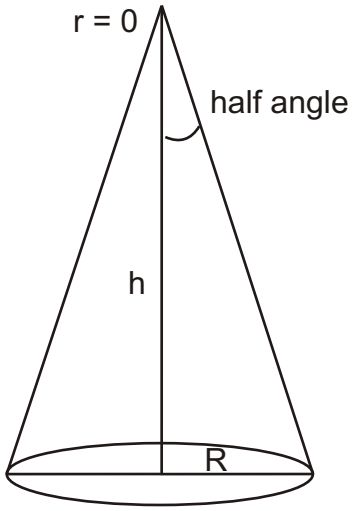
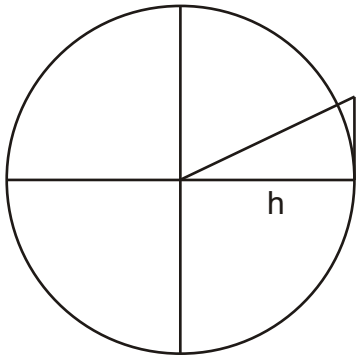
The Proof of Ernest Ferron's formula to find the slope of a saxophone neck in "The Saxophone is my Voice"





Important: The measurement of the slope of a cone is its "half angle".

The formula for slope as a **ratio** or "proportion" is slope = rise/run.

The rise is the large radius R minus the small radius r.

In the case of a complete cone, the small radius r is always equal to 0.

The "run" or height (or length) of the cone is represented by h or L.

Representing the slope in a circle, h or L or the "run" is equal to the radius.

The distance traveled along the arc of the circle equal to the length of the radius is called a **radian**. Since C = π D, C = π 2r is also true.

2π r = the circumference of a circle or 360°
π r = half the circumference or 180°

Since r (or h) = 1 radian, 1 radian = 180°/π or 57.3°

Inputting the figures derived from calculating the length of the missing cone by frequency, we get the following equation:

slope as a proportion = R - r ÷ L Where R = 6.3mm, r = 0, L = 225.3mm

slope as a proportion = (6.3mm - 0)/225.3 = .028

We know by this formula that the rise is .028 of the length.
We also know that the length (L) is equal to the radius of the circle (R)
Also by definition: the radius and radian are equal length.

1 radian = 57.3°, so the proportion of the rise in degrees is 57.3° x .028

Therefore the slope in degrees is 57.3° x .028 = 1.60°

Where Ferron confuses the issue is that instead of:

slope in degrees = 57.3 (R - r)/L

he uses

28.65 (D - d)/L which gives the same result!