Slide Rule 2 Page "How-To"

Multiplication: Multiplicand X Multiplier = Answer (C and D scales)
i) Set one of the C scale Indexes to the Multiplicand on the D scale.
ii) Set the cursor to the Multiplier on the C scale.
iii) Read the answer down the cursor on the D scale.
iv) Digit count is the sum of the digit count, less one if your slide protrudes to the right of the stock.

Division: Dividend/Divisor = Answer (C and D scales)
i) Set cursor to the Dividend on the D scale.
ii) Move the slide to align the Divisor on the C scale with the cursor.
iii) Read the answer down the C index on the D scale.
iv) Digit count is the Dividend count less the Divisor count, plus one if your slide protrudes to the right of the stock except for Dividend is 10^x ie 1, 10, 100, ...

Reciprocals: Reciprocal =1/y (CI and C scales)
i)set your cursor on the C scale
ii)read the reciprocal on the CI scale (note CI is a reverse scale read right to left)
iii)

Square and Square Root: Root x Root = Square (A and D scales)
Square:
i) Set the root on the D scale.
ii) Read the Square on the A scale.
iii) Digit count for the square is twice the digit count of the root less one if read the left half of the A scale,
and is twice the digit count of the root if read on the centre index or right half of the A scale.

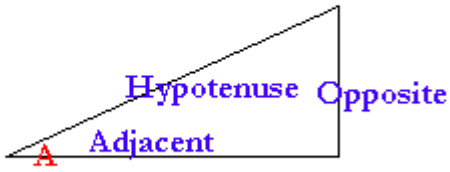
Square root:
i) If the digit count of the square is odd set the cursor to the square value in the left half of the D scale,
or if digit count is even set in the right half.
(1, 100, 10000 odd count 10^x are set on the left index of D, and 10, 1000, even count 10^x are set on the centre index of D)
ii) Read the root on the A scale
iii) Digit count. If the original digit count of the square was odd, add one and divide by two. Or if original square digit count was even, divide by two.

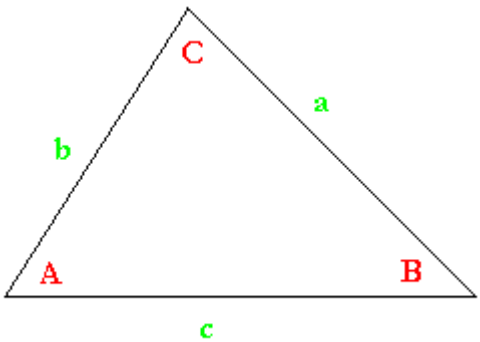
Cube and Cube Root: Root x Root X Root = Cube (D and K scales)
Cube:
i) Set the Root on the D scale.
ii) Read the Cube on the K scale.
iii) Digit count if the Cube is read in the left third of the K scale is three times the digit count of the Root less two,
if the Cube is read in the centre third of the K scale the digit is count three times the digit count of the Root less one,
and if the Cube is read in the right third of the K scale the digit count is three times the digit count of the Root.

Cube root:
i) Set the Cube on the K scale. If the Cube digit count divided by three has a remainder of 1/3 the Cube is set in the left portion of the K scale,
if the remainder is 2/3 the Cube is set in the middle third of the K scale, if the remainder is zero or digit count is zero, set it in the right third of the K scale.
ii) Read the Root on the D scale.
iii) Digit count is the digit count of the Cube divided by three. If answer is a decimal raise it the next integer for the digit count ie 1.333 becomes 2.

$$a/\sin A = b/\sin B = c/\sin C$$

$$a^2 = b^2 + c^2 - 2bc\cos A$$





Sines and Cosines: Sine of an Angle = Opposite / Hypotenuse, Cosine of an angle = Adjacent / Hypotenuse (S, ST, and D Scales (B on Manneheim rules))
Sine of an angle:
i) Set the angle on the S scale for 6 to 90 degrees (on some rules smaller angles can be set on the ST scale =+/-0.5 to 6 degrees)
ii) Read the Sine on the D scale normally 0.1 to 1(for smaller angles read the answer as 0.0xxxxx, 0.01 to 0.1)

For angles between 70 and 90 degrees, Sine is better calculated by utilising the following formula; Sine angle = sqr(1 - sin^2(90-angle)), 90-180; sine angle = sine (180- angle), 180-270; sine angle = -sine (angle -180); 270-360; sine angle= -sine(360-angle)
Cosine:
i) Cosine of an angle is equal to (sine of 90 degrees minus the angle)
90-180; cos angle = -sin(angle -90), 180-270; cos angle = -sin (270 -angle); 270-360; cos angle = sin(angle -270)
Arc sine:
i) Set the cursor to the number on the D scale
ii) Read the angle on the S scale (or ST for small angles)

Arc cosine:

Tan: Tan of an Angle=Opposite/Adjacent (T and D scales)
Tan:
i) Set the cursor to the angle on the T scale (set small angles on the ST scale)
ii) Read the Tan on the D scale (read tan of small angles on D scales as 0.0xxxx)
For angles 45-84; tan (90-angle) and read the D scale as 1 to 10.
For angles of 84 to 90 one needs to be a brain surgeon.....
90-180; tan angle =-tan(180-angle), 180 to 270; tan angle = tan (angle -180), 270 to 360; tan angle = -tan(360-angle)
Arc Tan:
i) Set the cursor to the tan on the D scale
ii) Read the angle on the T scale
If tan is less than 0.1, multiply it by 57.3 for the angle. (Best done on your C and D scales)
84 -90 degree angles are problem children....

Pythagoras theorm:
Pythagoras rule is the length of the *Hypotenuse*=sqrt(*Adjacent*^2+*Opposite*^2) or Hypotenuse^2=(Adjacent^2+Opposite^2)

To calculate the Hypotenuse
i)move the center index of the B scale over the value of *Adjacent* on the D
ii)move your cursor to the value of the *Opposite* on the D scale
iii) read the value(n) under the cursor line on the B scale
iv) add the value(n) on the B scale to 10
v) move your cursor to the value found in iv) on B
iv)read the value of the *Hypotenuse* on D scales , below 10+n on B

Common Log: log (10^x)=x (L and D scales)
Log:
The log of a number is made up of two components, the characteristic and the mantissa. The log is denoted as *characteristic.mantissa*.
The characteristic is one less than the digit count of the number.
i) Set the number on the D scale
ii) Read the mantissa on the L scale
Antilog:
i) Set the mantissa on the L scale
ii) Read the number on the D scale
iii) Digit count of number is one more than the characteristic (decimal place)

Raising a number to a power: n = x^y (scales C, LLx, & LL0x for numbers between 0.00005 & 0.999)
i) place the left index of the C scale over x on the LLx scale
ii) move your cursor to y on the C scale
iii) read your answer n on the LLx scale
iv) Decimal place?

*1 Positive digit count is the number of digits to the left of the decimal point ie 1234.567 has a digit count of 4
Negative digit count is the number of zeros to the right of the decimal point ie 0.000123 has a digit count of -3

*2 Always set numbers on the scale by shifting the decimal point to between the first and second most significant digit ie 1234 is set as 1.234

*3 Technique for accurately setting a number to five places By example let's set 2.5793. Place hairline on 2.5 on D scale. Place C index on 793 (7.93) on D scale. Then move the slide ever slightly to the left, just enough so that the hairline (still at 2.5) coincides with the next 1/10 line on C (in this case 3.2). Move the hairline 0.1 to the right. (3.2 + 0.1 = 3.3) Under the hairline, on D, you now have exactly 2.5793. (The accuracy depends on how exactly you interpolate the 3 in 793, which shouldn't be difficult. Otherwise, the procedure operates only with engraved lines.)