

## u D: n mu mu Secant Slope

	<p><math>x</math> <math>u</math> <math>D: 1</math> <math>y</math> is the secant slope of the function <math>u</math> through the points <math>y</math> and <math>y+x</math>. The secant slope is generalized to the case <math>x</math> <math>u</math> <math>D. n</math> <math>y</math> in the manner of the derivative <math>D..</math> The argument <math>x</math> may be a list, giving several slopes.</p> <p>In the general case, each item of <math>x</math> has the shape <math>\{ . \\$\\$"r</math> <math>y</math>, where <math>r</math> is the rank of <math>u</math>, therefore specifying the increment in each possible direction. An argument <math>x</math> of lower rank is extended in the usual manner. For example, <math>x=: 1e_8</math> provides the same increment in each direction and, because of the small magnitude, yields an approximation to the derivative.</p>
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1 log D:1 y
0.405465 0.287682 0.223144

incr=: 1 0.1 0.01 1e_8
incr log D:1/y
0.405465 0.287682 0.223144
0.487902 0.327898 0.246926
0.498754 0.332779 0.249688
0.5 0.333333 0.25

log D.1 y
0.5 0.333333 0.25
%y
0.5 0.333333 0.25

f=: +/@:*\ "1 [ . g=: +/@:*\ "1
(f y) ; (1 f D:1 y) ; (1 0.1 1e_8 f D:1 y)
+-----+
| 29 | 5 7 9 | 5 0.61 8e_8 |
|   |   | 50 6.1 8e_7 |
|   |   | 5e8 6.1e7 8 |
+-----+
(g y) ; (1 g D:1 y)
+-----+
| 4 13 29 | 5 0 0 |
|   | 5 7 0 |
|   | 5 7 9 |
+-----+

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