

# Index

## A

acceleration, 125  
addition, 10  
animation, 102, 127  
antiderivative, 53  
arc length, 75  
    of polar curve, 112  
area  
    of polar region, 112  
    of region between curves, 71  
    of surface of revolution, 76  
asymptote  
    horizontal, 44  
    slant, 44  
    vertical, 29  
Autoscale, 58  
average value of function, 53

## C

cardioid, 111  
chain rule, 134  
concavity, 42  
constants  
    built-in, 11  
continuity  
    definition of, 20  
cross product, 120  
crosshair, 12  
curvature, 126, 130  
    radius of, 130  
cycloid, 103, 107  
    curtate, 107  
    prolate, 107, 110

## D

deleting regions, 8  
Derivation Format

Show Derivation Comments,  
    33

Show Derivation Steps, 33

derivative  
    higher order, 34  
discontinuity, 21  
difference quotient, 27  
differentiation  
    higher order, 34  
    implicit, 134  
    numerical, 24, 41  
    of vector-valued function, 124  
    partial, 132  
    symbolic, 24, 34, 125  
discontinuity, 18, 20  
disk method, 73  
displayed precision, 13, 91  
division, 10  
dot product, 120

## E

e, base of the natural log, 20  
Edit menu  
    View Regions, 9, 144  
equations  
    solving, 12  
    solving symbolically, 34  
Error Function, erf, 65  
expand, 33  
Expand to Series, 92, 95  
exponential function  
    definition, 59  
exponential threshold, 91, 126  
expressions  
    editing, 11  
    evaluating numerically, 11  
    evaluating symbolically, 33

- expanding symbolically, 33
- factoring symbolically, 33, 35
- simplifying symbolically, 33

extrema

- of function of 2 variables, 138

**F**

factoring, 33, 35

Ferris wheel, 109

File menu

- Insert, 73
- Open, 7
- Print, 10
- Save, 7
- Save As, 7

Find a Rectangle game, 15, 19

Fresnel Cosine Integral, 64

Fresnel Sine Integral, 65

function

- average value of, 53
- differentiable, 29
- inverse, 59
- smooth, 29

functions

- built-in, 11
- defining, 11

Fundamental Theorem of Calculus, 51

**G**

Given ... Find, 101, 106

Graph Format

- Autoscale, 58
- Grid Lines, 57
- Show Markers, 17, 19, 36

Graph Format dialog, 12, 16, 19

Graphics menu

- Create Polar Plot, 111
- Create X-Y Plot, 12

graphs

- autoscale, 58
- creating, 12
- formatting, 12
- grid lines, 57

- height, 9
- markers, 17, 19, 36
- of several functions, 12
- parametric, 100
- placeholders, 12
- polar, 111
- reading coordinates off, 12
- resizing, 8
- scaling of, 12
- width, 8
- zooming, 12, 17

Grid Lines, 57

**H**

hyperbola, 110

hypocycloid, 108

**I**

if function, 14, 19–20

implicit differentiation, 134

infinite series, 90

- recursive formula for partial sums, 90

inflection

- point of, 42

inserting documents, 73

integral

- definite, 51
- improper, 82
- indefinite, 51

integration

- by substitution, 63
- midpoint rule, 52
- numerical, 51
- Simpson's rule, 52
- symbolic, 51, 61
- techniques of, 80
- trapezoidal rule, 52

**L**

length of vector, 119

limit

- approximating numerically, 19–20
- definition of, 15

## line

- secant, 25, 48
- tangent, 30, 48

## logarithmic function

- definition, 58
- properties, 58

## logistic model, 89

**M**

## Maple V, 37, 73, 76

- 3-D plot window, 121
- animation window, 102

## Math menu

- Built-in Variables, 118
- Matrices, 118
- Numerical Format, 13, 126

## Matrices dialog box, 118

## maximum

- of function of 2 variables, 138
- relative, 42

## Mean Value Theorem, 48

## midpoint rule, 52

## minimum

- of function of 2 variables, 138
- relative, 42

## moving regions, 8

## multiplication, 10

**N**

## negation, 10

## normal

- to a surface, 137
- to parametric curve, 104

## number

- complex, 34
- irrational, 32
- rational, 32

## numbers

- displayed precision, 13

## Numerical Format dialog, 13, 91

**O**

## ORIGIN built-in variable, 118

**P**

## parametric plots, 100

## partial differentiation, 132

## partial fractions, 81

## Polar Plot menu, 112

## polar plots, 111

## power, 11

## principal unit normal vector, 126

**R**

## range variable, 11, 145

## regions, 6

- deleting, 8

- moving, 8

## resizing graphs, 8

## Riemann sum, 52

## Rolle's Theorem, 48

## root function, 12, 26, 42, 72

**S**

## saddle point, 138

## self-intersection

- of parametric curve, 106

## sequence, 85

## shell method, 75

## Show Markers, 17, 19, 36

## simplify, 33

## Simpson's rule, 52

## Sine Integral, Si, 65

## solve block, 101, 106

## Solve for Variable, 34

## speed, 125

## subscripts

- literal, 25

- numeric, 85, 119

## Substitute for Variable, 31, 33,

- 35, 63, 93

## subtraction, 10

## summation, 52

- range, 52

## Symbolic menu

- Collect on Subexpression, 135

- Convert to Partial Fraction,

- 81

- Derivation Format, 32
- Derive in Place, 126
- Differentiate on Variable, 34
- Evaluate Symbolically, 33
- Expand Expression, 33
- Expand to Series, 92, 95
- Factor Expression, 33, 35
- Load Symbolic Processor, 32
- Simplify Expression, 33
- Solve for Variable, 34
- Substitute for Variable, 31, 33, 35, 63, 93
- symbolic processor, 31

**T**

- tables
  - of values, 25
- tangent
  - plane, 137
  - to parametric curve, 104
  - to polar curve, 112
- Taylor polynomial, 92
- tolerance, 13
- Trace Type
  - lines, 12
  - points, 12, 16, 19
- trapezoidal rule, 52
- trochoid, 107

**U**

- unit tangent vector, 126
- units, 118

**V**

- variable
  - range variable, 11, 145
- variables
  - assigning a value to, 11
  - defining, 11
  - predefined, 11
  - unassigned, 33
- vector
  - cross product, 120
  - dot product, 120
  - length of, 119

- principal unit normal, 126
- projection, 120
- unit tangent, 126
- vector-valued function, 124
- vectors, 118
- velocity, 125
- view regions, 9, 144
- volume of solid of revolution, 73

**W**

- washer method, 73

**X**

- X-Y Plot menu
  - Crosshair, 12
  - Zoom, 12

**Z**

- zero tolerance, 91
- zooming graphs, 12