Index

Adjacent (right-angled triangle) 163 Algebraic expressions 10 Angle of depression 176 Angle of elevation 176 Area of a triangle 183 given two sides and the included angle 185 Heron's rule 188, 203, 222 that are not right angled 184 Bar graphs 8, 21 Bearings 175-6, 177 Bell shaped curve 226 **Bimodal 9** Bivariate data 14 Box and whisker diagrams (boxplots) 67-70 versus histograms 71 Categorical data 15 displaying 16 **Categorical variables 15** Collinear points 177 **Column graphs 8 Compass bearings 176** Continuous data 18 **Continuous variables 18 Coordinates 7** Cosine (cos) ratio 162-4 Cosine rule 194–7 Data, types of 14 Data analysis 8, 12, 29–82 grouped data 39 Data display 8, 12, 16, 19-26, 67-72 Describing distributions 44-6, 71-2, 74-7 Discrete data 18 Discrete variables 18, 19 Distributions describing 44-6, 71-2, 74-7 location, spread and shape 71-5 skewness 72-3 Dot frequency graphs 8, 21 Elimination method, simultaneous eqns 209, 212 Equation of a straight line 128-9, 138-9, 141 given gradient and one point on the line 139 given the gradient and vertical intercept 139 given two points that lie on the line 140 Equations from ratios 112 from simple interest formula 111 solving 85-95 to solve problems 99-118

see also linear eqns; simultaneous linear eqns

Expanding brackets 10

Five-number summary 67 Formulae 10, 85, 111 Frequency histograms 8, 19-26 Frequency polygons 20 Frequency tables 59 Gaussian distribution 226 Gradient of a straight line 123, 124-7 Grouped data 39-43 standard deviation 60-2 Heron's rule 188, 203, 222 Hexapatterns 103 Histograms 8, 19-26 versus boxplots 71 Horizontal lines 131 Hypotenuse 163 Interguartile range 67 Linear equations simultaneous 207-18 solving 85-95 Linear relationships 121-41 in practical situations 142-7 see also straight line graphs Lines parallel to the x-axis 131 Lines parallel to the y-axis 131 Lower quartile 67 Mean 8, 30-3 Notation 8, 31, 231 Mean deviation 50 Measures of central tendency 30, 49, 63 see also mean; median Measures of dispersion (spread) 49-63 see also range; standard deviation Measures of location 30 Median 9, 30-1, 67 Median class 40 Median group 40 Midpoint of each interval 40 Modal class 40 Modal group 40 Mode 9, 30-1 Negatively skewed distributions 72, 73 Nominal categorical variables 15 Non right-angled triangles 183-203 Normal distribution 226-36 notation for mean and standard deviation 231 and percentiles 233 and quantiles 233

and standard deviations 226 and z scores 228 Number, use of 7 Number puzzles 103–7 Numerical data 18 displaying 19–21 Numerical variables 18

Opposite (right-angled triangle) 163 Ordinal categorical variables 15 Outliers 8, 59, 69

Percentage frequency 20 Percentiles 233–6 Pictograms 8 Piecewise defined relationships 151–6 Positively skewed distributions 73 Primary data 14 Probability 11, 226 Proportional bar graphs 8 Pyramids 99–101 Pythagorean theorem 11, 168

Quantiles 233–6 Quartiles 67

Range 9, 31, 49 Ratios 7 equations from 112–13 Relative frequency 20 Right-angled triangles, trigonometry 159–66

Secondary data 14 Similar triangles 11, 113-14 Simple interest formula 111 Simultaneous linear equations 207-18 solving graphically 210 solving using calculators 208 solving using elimination method 209, 212 solving using substitution method 209, 211 word problems 213-18 Sine rule 190-3, 197-8 Sine (sin) ratio 162-6 Skewness of distributions 72-3 **SOHCAHTOA 163-4** Solving equations 85–95 with brackets or fractions 88-92 linear equations 92-5 simultaneous linear equations 207-18 Standard deviation 50, 51-8 grouped data 60-2 and normal distribution 226-8 notation 54, 231 and outliers 59 and standard scores 223-5

Standard normal distribution 228 Standard scores 223-5, 228 Statistical functions on a calculator 38-9, 53-4 Statistical investigation process 81-2 Statistical tables 228 Stem and leaf plots 8.31 Step graphs 152 Straight line graphs 123-47 gradient 123, 124-7 on graphics calculators 132 lines parallel to the axes 131 rule 128-9 table - rule - graph 129-30 see also equation of a straight line Substitution method, simultaneous linear equations 209, 211 Subtending, definition 177 Summarising data 8-9, 12, 29-37 grouped data 39-43 Summary statistics 30 Tangent (tan) ratio 161-6 Three figure bearings 176 Triangles area 183-90 cosine rule 194-7, 198-9 sine rule 190-3, 197-8 Trigonometric ratios 161-6 Trigonometry for right-angled triangles 159-79 accuracy in trigonometric questions 175 angles of elevation and depression 176–7, 178–9 applications 168-74 bearings 175-6, 177 calculator usage 166-7 Trigonometry for non right triangles 183–203 area of a triangle 183-90 cosine rule 194-7, 198-9 sine rule 190-3, 197-8 Univariate data 14 Upper quartile 67 Variables 14 categorical 15 numerical 18 Variance 50, 231

Y = mx + c 128-9, 138-9 y-intercept 128, 129

Vertical intercept 129

Vertical lines 131

Z score 228