

Review for Mid-Term Exam

1. Arithmetic Calculations using Calculator, Maple or Wolfram-Alpha

Calculations and Order of Operations

$$2*3^5, \frac{13-3}{7}, \frac{1}{5} - \frac{2}{3} - \frac{3}{7}, 2+4!, \frac{\frac{2}{3}}{\frac{5}{8}}$$

Factorials, Combinations, Binomial Coefficients

$$\frac{24!}{15! 9!}, {}_{24}C_{15}, \text{binomial}(24,15)$$

2. Floating Point Calculations

$$1 + \frac{1}{6!}, 1 + \frac{1}{50!}$$

Experiment

$$n^2 \text{ vs } 2^n$$

3. Elementary Number Theory using Calculator, Maple or Wolfram-Alpha

Division Algorithm, Euclidean Algorithm

gcd, lcm

Using Euclidean Algorithm

Using Calculator, Maple or Wolfram-Alpha

Fundamental Theorem of Arithmetic

Statement

Prime, Composite, Relatively Prime, Prime Power Factorization

Prime: 279, 1373, 371

Relatively prime: (103,107), (39,65), (132,975)

Prime power factorization: 3050, 8!, 480

Modular Arithmetic

$$\text{Base 11: } [35]+[23]*[47], [7]^5$$

Even, Odd

Why is the product of an even number and an odd number an even number?

Divisibility Rules

Determine whether the integers in the left column are divisible by the factors in the top row:

	2	3	4	5	6	7	8	9	10	12	15	18	24	36
280														
1920														
3080														

Alternate Bases

Convert 327 to base 5

4. Statistics

Measures of central tendency

Mean, Median, Mode, Midrange

Given 70, 32, 56, 78, 63, 67, 94, 22, 56, 72, 84, 56, 40, 78, 92, 67 find mean, median, mode, midrange

Measures of dispersion

Standard Deviation, Range, Quartiles, Inner Quartile Range

Given 70, 32, 56, 78, 63, 67, 94, 22, 56, 72, 84, 56, 40, 78, 92, 67 find standard deviation, range, quartiles, inner quartile range

Frequency Distribution, Histogram

Given 70, 32, 56, 78, 63, 67, 94, 22, 56, 72, 84, 56, 40, 78, 92, 67 construct a frequency distribution, histogram

Scatter plot, regression line, correlation coefficient

Given data:

Age: 14, 15, 13, 14, 17, 12, 15, 19, 14, 13
Height: 60, 72, 65, 68, 67, 62, 66, 68, 66, 64

Create scatter plot and find linear regression line and correlation coefficient