

## Review for Exam 1

Sections 9.3, 9.4 and 9.5 Sequences and Series

definitions:

Sequence

Series

Sigma Notation

Arithmetic:

Def:

$$a_n = a + (n - 1)d$$

$$S_n = \frac{n}{2}(2a + (n - 1)d) = n\left(\frac{a+a_n}{2}\right)$$

Geometric:

Def:

$$a_n = ar^{n-1}$$

$$S_n = \frac{a(1-r^n)}{1-r}$$

$$S = \frac{a}{1-r} \text{ for } |r| < 1$$

Sections 1.4, 1.5, 1.6 and 1.7 Graphs, symmetry, lines, etc.

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$M = \left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$$

Characteristics of graphs:

x and y intercepts

symmetry

domain/range

increasing/decreasing

Reflecting a line segment

testing an equation for symmetry

Equations of lines:

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\Delta y}{\Delta x}$$

$$\text{point-slope } y - y_1 = m(x - x_1)$$

$$\text{slope-intercept } y = mx + b$$

standard  $Ax + By + C = 0$  with  $A$ ,  $B$  and  $C$  integers

parallel lines have the same slope

perpendicular lines have negative reciprocal slopes  $m_1 = \frac{-1}{m_2}$

Appendix B: Simplification, Factoring and Vital Errors

Sections 2.1 and 2.2: solving equations

$ax^2 + bx + c = 0$  has solutions  $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

discriminant

sum and product of roots for  $x^2 + bx + c = 0$  (i.e.  $a = 1$ )

taking  $n$ th roots of equations (even v. odd)

equations of quadratic type

equations with fractions

equations with roots

extraneous roots (always check your answers)

equations with abs. value

Section 2.4 Word problems

Sections 2.5 and 2.6: Inequalities

interval notation

compound

absolute value

rational/polynomial