Competition A: Open to all students.

Vectors (Conference Graphing Calculator)

SWSC I Vector addition; norm (magnitude) of a vector; scalar multiplication; inner (dot) product; parallel, orthogonal (perpendicular) vectors; no 3-space. Specify form of answer. Vectors will be in form <a, b>.

SWSC III Include angle between vectors; angle between lines; 3-space <a, b, c>. Specify form of answer.

Series and Sequences (No Calculator)

SWSC I Arithmetic, Geometric; nth term, sum of n terms, sum of infinite geometric

SWSC III add harmonic, recursive, other number patterns derived from combinations of arithmetic and geometric sequences; may include one non-traditional sequence/series.

Competition B: Closed to Seniors

Systems of Equations (No Calculator)

SWSC I Literals of 2 x 2 system; 2 or 3 variables over rationals; describe system as consistent/dependent, consistent/independent, or inconsistent; no quadratic-linear systems; no word problems; no quadratic-quadratic systems; May include 1/x + 2/y, etc.

SWSC III May include quadratic-linear or quadratic-quadratic systems; no word problems.

Right Triangle Geometry (Conference Graphing Calculator) General restrictions: NO TRIG

SWSC I Pythagorean theorem; may use 30-60-90 and 45-45-90 right triangle exact relationships; may use similar triangle problems, may include plane figures that can be reduced to right triangles.

SWSC III May include one simple application.

Competition C: Closed to Juniors and Seniors

Word Problems (Conference Graphing Calculator)

SWSC I Two of the problems may be non-routine; may involve a 2 x 2 system; no quadratics; no digit problems.

SWSC III may include at most one digit problem

Linear Functions (No Calculator)

SWSC I Use of function notation; write the equation of a linear function in slope-intercept form; know x and y intercepts (values or ordered pairs); may include parallel and perpendicular lines.

SWSC III At most one application problem.

Competition D: Open to Freshmen Only

Linear Equations and Inequalities (No Calculator)

Contest I May include rational coefficients. No literals.

Contest III May include at most one literal equation; at most one equation which 'reduces' to a linear equation; no literals in inequalities.

Exponents & Radicals (No Calculator)

SWSC I No fractional exponents (except ½); illustrate properties of exponents, simplify square roots, addition and subtraction of square roots

SWSC III Simplify expressions with exponents with variables; ~~no fractional exponents (except ½);~~ add multiplication division of square roots; domain for variables positive reals.

Competition A: Open to all students.

Trigonometric Word Problems (Conference Graphing Calculator)

SWSC II Problems will require the use of right triangle trig to solve. Answers may be exact, rounded or in terms of a trig function.

SWSC IV Problems may require the use of law of cosines and/or law of sines to solve. Answers may be exact, rounded or in terms of a trig function.

Matrix Algebra (No Calculator)

SWSC II Addition, subtraction, multiplication; inverse (2 x 2); determinants (2 x 2); solve simple matrix equations; sum of the dimensions must be no greater than eight; original matrix – integers.

SWSC IV determinant (3 x 3); inverse (3 x 3); adjoint; cofactor; transpose (notation for A transpose will be A^T).

Competition B: Closed to Seniors

Ratio/Proportion/Variation (Conference Graphing Calculator)

SWSC II either linear solving or at most 2 x 2 linear system to solve; at most one application problem

SWSC IV add quadratic equations to solve; 3 x 3 linear systems which can be solved on graphing calculator, may include applications

Area/Perimeter/Volume (No Calculator)

SWSC II Area and Perimeter only; may include solution via solving a system of equations

SWSC IV add volume.

Competition C: Closed to Juniors and Seniors

Polynomials (No Calculator)

SWSC II Addition, subtraction, multiplication; degree, coefficient, evaluation, number of terms

SWSC IV Add division

Probability (No Calculator)

SWSC II Sample space, dice, coins, boy and girl children or similar to this, keep it simple

SWSC IV Independent, dependent, no combinations or permutations.

Competition D: Open to Freshmen Only

Linear Word Problems (Conference Graphing Calculator)

SWSC II Age, integer, and coin problems; equations must be linear with integral coefficients and easily solvable; systems are not required for solutions.

SWSC IV May also include one number, simple motion, mixture, or simple perimeter problem; no digit problems; systems are not necessary for solutions.

Graphs (No Calculator)

SWSC II Identify quadrants, x-axis, y-axis, origin; identify coordinates of points; identify x-intercepts and y- intercepts given a graph

SWSC IV Add identify the slope, intercepts and equation of a line given its graph; identify the point of intersection given two graphs.