

Mathematics Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

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Source Documents:

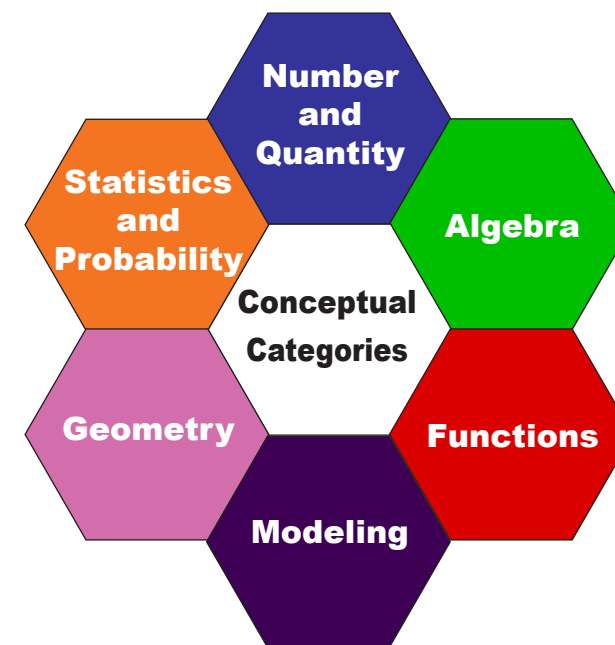
Based on Common Core Standards for Mathematics

Adapted from Escondido Union High School District: "I Can" Statements

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Common Core Integrated Math III Grade 11 Expectations Checklist



Statistics and Probability

Interpreting categorical and quantitative data (S-ID)

Summarize, represent, and interpret data on a single count or measurement variable (4)

- use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages

Making Inferences and Justifying Conclusions (S-IC)

Understand and evaluate random processes underlying statistical experiments (1, 2)

- understand statistics as a process for making inferences about population parameters based on a random population sample
- decide if a specified model is consistent with results from a given data-generating process

Make inferences and justify conclusions from sample surveys, experiments and observational studies (3, 4, 5, 6)

- recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each
- use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling
- use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant
- evaluate reports based on data

Using Probability to Make Decisions (S-MD)

Use probability to evaluate outcomes of decisions (+) (6, 7)

- use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator)
- analyze decisions and strategies using probability concepts



My checklist of what I can do in Integrated Mathematics III – Grade 11.

I understand that it is important to apply the mathematical practices (listed on fold-out section) on a regular basis.

Number and Quantity

The Complex Number System (N-CN) Use complex numbers in polynomial identities and equations (8,9)

- extend polynomial identities to the complex numbers
- know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials

Algebra

Seeing Structure in Expressions (A-SSE) Interpret the structure of expressions (1a-b, 2).

- interpret parts of an expression such as terms, factors, and coefficients
- interpret expressions by viewing one part as a single entity

Write expressions in equivalent forms to solve problems (4)

- derive the formula for the sum of a finite geometric series and use it to solve application problems

Arithmetic with Polynomials and Rational Expressions (A-APR)

Perform arithmetic operations on polynomials (1)

- understand that polynomials form a system that is closed under addition, subtraction, and multiplication and solve problems in and out of context

Understand the relationship between zeros and factors of polynomials (2, 3)

- know and apply the Remainder Theorem for polynomial functions
- identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the polynomial function

Use polynomial identities to solve problems (4, +5)

- prove polynomial identities and use them to describe numerical relationships
- know and apply the Binomial Theorem for the expansion of $(x + y)^n$ in powers of x and y for a positive integer n , where x and y are any numbers, with coefficients determined for example by Pascal's Triangle

Rewrite rational expressions (6, +7)

- rewrite simple rational expressions in different forms using long division, inspection, or technology
- understand that rational expressions form a system closed under addition, subtraction, multiplication, and division by a nonzero expression; perform such operations

Creating Equations★ (A-CED)

Create equations that describe numbers or relationships (1, 2, 3, 4)

- create equations and inequalities in one variable and use them to solve problems. **Include equations arising from linear and quadratic functions, and simple rational and exponential functions.**
- create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales
- represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context
- rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations

Reasoning with Equations and Inequalities (A-REI)

Understand solving equations as a process of reasoning and explain the reasoning (2)

- solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise

Represent and solve equations and inequalities graphically (11)

- explain why the x -coordinates of the points where the graphs of two functions, $f(x)$ and $g(x)$, intersect is the solution to $f(x)=g(x)$; find the approximate solutions using technology and varying methods (tables, graphs, etc.)

Functions

Interpreting Functions (F-IF)

Interpret functions that arise in applications in terms of the context (4, 5, 6)

- interpret key features of functions such as intercepts, extrema, intervals for increasing and decreasing, etc. in graphs and tables
- relate the domain of a function to its graph and quantitative relationship in context
- calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph

Analyze functions using different representations (7b-c, 7e, 8, 9)

- graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions
- graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior
- graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude
- write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function
- compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions)

Building Functions (F-BF)

Build a function that models a relationship between two quantities (1b)

- combine standard function types using arithmetic operations

Build new functions from existing functions (3, 4a)

- identify the effect on the graph by replacing $f(x)$ with $f(x) +k$, $kf(x)$, $f(kx)$, and $f(x+k)$ and find values of k given graphs
- solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse

Linear, Quadratic, and Exponential Models★ (F-LE)

Construct and compare linear, quadratic, and exponential models and solve problems (4)

- for exponential models, express as a logarithm the solution to $ab^{ct} = d$ where a , c , and d are numbers and the base b is 2, 10, or e ; evaluate the logarithm using technology

Trigonometric Functions (F-TF)

Extend the domain of trigonometric functions using the unit circle (1, 2)

- understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle
- explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle

Model periodic phenomena with trigonometric functions (5)

- choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline

Geometry

Similarity, Right Triangles, and Trigonometry (G-SRT)

Apply trigonometry to general triangles (9, 10, 11)

- derive the formula $A = 1/2 ab \sin(C)$ for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side
- prove the Laws of Sines and Cosines and use them to solve problems
- understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles

Geometric measurement and dimension (G-GMD)

Visualize relationships between two-dimensional and three-dimensional objects (4)

- identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects

Modeling with Geometry (G-MG)

Apply geometric concepts in modeling situations (1, 2, 3)

- use geometric shapes, their measures, and their properties to describe objects
- apply concepts of density based on area and volume in modeling situations
- apply geometric methods to solve design problems

Statistics and Probability

(Continued on fold-out section of this bookmark)

How to use checklist:

- Show the date of when you were able to do the math expectation.
- Show an example of what you did in a journal.