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Welcome to Algebra 3-4! My classroom expectations are consistent with the FHS Student Handbook.

Phones:
I will be enforcing the FHS policy around phones. Additionally, if students need to leave the room to use the restroom, go to their locker, or get a drink, they must trade their phone for the hall pass. If a student doesn't have a phone, I need a signed note from a parent or guardian verifying that is true.

Grading:
Scores on standards and skills will be:
- **10:** Indicates you are highly proficient in that skill
- **7:** Indicates you are proficient (passing) in that skill
- **4:** Indicates you are close to proficient (not passing, but getting there)
- **1:** Indicates you are developing in a skill (you have some content to learn before retaking)
- **0:** Indicates you missed a test

Overall semester grades will be based on:
- Unit Tests, which will be entered by individual skill and can be retaken
- Midterm, around the end of first quarter and will be entered as a full score (not individual skills) and can be retaken (as a whole)
- Final Exam, also entered as full score, cannot be retaken

Retakes:
Unit/Skill tests may be retaken as many times as needed to achieve proficiency level. However, to retake for more than a 7, students must use stamps they have earned through classwork and homework.

Classwork/Homework:
Daily assignments and activities are meant for skill building and practice, but will not be entered into the gradebook except for tracking purposes. Students are strongly encouraged to keep a notebook to keep notes organized. Daily work will be stamped and stamps may be accrued to earn highly proficient retakes, a second rough grade, or a point-out of a mistake on a test. Formative assessments may also be entered into the gradebook for tracking purposes, but will not affect the grade.

Resources:
My website is at the top of the sheet and will contain links to worksheets, videos, etc. for topics we cover each day. I recommend going to it and creating a shortcut on your homescreen so you can easily access it. Franklin also offers a tutoring center, which I recommend. We have tutorials during full 5-day weeks, but it is rare that I am available for intensive one-on-one tutoring. To make up for my lack of outside-of-school time, I have a bank of videos on YouTube on my Andrews Algebra channel; they can be found under the Advanced Algebra 2018-2019 playlist (for now- eventually they will be updated for this year)

Differentiation Strategies:
Students will be given open-ended questions on a daily basis; they will be able to determine the level of difficulty themselves. Whenever possible, students will be given options of two different tasks; they will have the choice of which will be more accessible for them.
Honors credit is available for students interested. That information will be available on my website by the end of September.
Vocabulary will be available to all students for each unit. Those vocabulary lists will be posted on my website as well.

Standards Covered
Please be aware that the standards below are very wide, and can be interpreted in many ways. The skills that will be assessed in each unit will be made clear on the Unit Stamp Sheets students receive at the beginning of each unit. These may also be found on my website as we reach each unit.

Unit 1: Equations and Inequalities
Priority Standards:
HSA.CED.A.1 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.*
HSA.CED.A.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
Supporting Standards:
HSA.REI.A.2 Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.
HSA.CED.A.3 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. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.*
HSA.CED.A.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange Ohm's law V = IR to highlight resistance R.*

Unit 2: Parent Graphs
Priority Standards:
HSF.IF.B.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.**
HSF.IF.C.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.*
HSF.IF.C.7.B Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.
HSF.BF.B.3 Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\,f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.
HSF.IF.B.5 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.**
Supporting Standards:
HSF.IF.C.8 Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.
HSA.SSE.B.3.A Factor a quadratic expression to reveal the zeros of the function it defines.
HSA.SSE.B.3.B Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.
HSG.GPE.A.2 Derive the equation of a parabola given a focus and directrix.
HSF.BF.A.1 Write a function that describes a relationship between two quantities.*

Unit 3: Inverses
Priority Standards:
HSF.BF.B.4 Find inverse functions.

HSF.BF.B.4.A 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. *For example, f(x) =2 x3 or f(x) = (x+1)/(x-1) for x ≠ 1.*

Unit 4: Logarithms and Exponentials

Priority Standards:

HSF.LE.A.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.

HSF.IF.C.7.E Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.

Supporting Standards:

HSF.IF.B.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.**

HSF.IF.C.8.B Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)12^t$, $y = (1.2)^t/10$, and classify them as representing exponential growth or decay.

HSF.BF.A.1.A Determine an explicit expression, a recursive process, or steps for calculation from a context.

HSF.BF.A.1.B Combine standard function types using arithmetic operations. *For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.*

HSA.SSE.A.1.B Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P.*

Unit 5: Complex Numbers and Roots

Priority Standards:

HSN.CN.A.1 Know there is a complex number *i* such that $i^2 = -1$, and every complex number has the form $a + bi$ with *a* and *b* real.

HSN.CN.A.2 Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.

HSN.CN.C.7 Solve quadratic equations with real coefficients that have complex solutions.

Unit 6: Polynomials

Priority Standards:

HSA.APR.A.1 Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

HSA.APR.B.3 Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.

HSF.IF.C.7.C Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.

Supporting Standards:

HSA.APR.B.2 Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number *a*, the remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.

HSA.APR.C.4 Prove polynomial identities and use them to describe numerical relationships. *For example, the polynomial identity $(x^2 + y^2)^2 = (x^2 - y^2)^2 + (2xy)^2$ can be used to generate Pythagorean triples.*

HSA.SSE.A.1 Interpret expressions that represent a quantity in terms of its context.*

HSA.SSE.A.1.A Interpret parts of an expression, such as terms, factors, and coefficients.

HSA.SSE.A.1.B Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P.*

HSF.IF.B.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.**

HSF.BF.B.3 Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\,f(x)$, $f(kx)$, and $f(x + k)$ for specific values of *k* (both positive and negative); find the value of *k* given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them

Unit 7: Rational Expressions

Priority Standards:

HSA.APR.D.6 Rewrite simple rational expressions in different forms; write $^{a(x)}/_{b(x)}$ in the form $q(x) + {}^{r(x)}/_{b(x)}$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$, using inspection, long division, or, for the more complicated examples, a computer algebra system.

Supporting Standards:

HSA.SSE.A.2 Use the structure of an expression to identify ways to rewrite it. *For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.*

HSA.SSE.B.3.A Factor a quadratic expression to reveal the zeros of the function it defines.

HSN.RN.B.3 Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational

Unit 8: Trigonometric Functions

Priority Standards:

HSF.TF.A.2 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.

HSF.TF.B.5 Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.*

HSF.IF.C.7.E Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.

Supporting Standards:

HSF.TF.A.1 Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.

HSF.TF.C.8 Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to find $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ given $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ and the quadrant of the angle.

HSF.IF.B.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.**

Unit 9: Statistics

Priority Standards:

HSS.ID.A.4 Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve

Supporting Standards:

HSS.IC.A.1 Understand statistics as a process for making inferences about population parameters based on a random sample from that population.

HSS.IC.A.2 Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. *For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?*

HSS.IC.B.3 Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.

HSS.IC.B.4 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.

HSS.IC.B.5 Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.

HSS.IC.B.6 Evaluate reports based on data.