Course Syllabus

Franklin High School	2020-2021

DIRECTIONS: For each course, complete the syllabus and share with your evaluating/supervising administrator **as a pdf** ("File-download-PDF document") by 9/28/20. Syllabi will be posted on the FHS website under your name for the public to view.

Course Overview

NOTE: For core classes, all elements of this section (except for name and contact information) are the same.

Course Title: Functions Statistics and Trigonometry	
Instructor Name: Kevin Denney	Contact Info: kdenney@pps.net
Grade Level(s): 12	
Credit Type: (i.e. "science", "elective") Math elective	# of credits per semester: .5
Prerequisites (if applicable): Pass Advanced Algebra 34	

General Course Description:This course is a fourth year math class and considered an upper level math class. Students should have passed Algebra, Geometry, and Advanced Algebra. The class will cover some of the basics of both Precalculus and Statistics. The students will be tested on each chapter and a cumulative final at the end of each semester.

Prioritized National/State Standards:

Standards Covered

Please be aware that the standards below are very wide, and can be interpreted in many ways. This class will review many of the standards from Advanced Algebra. It will also introduce standards for precalculus and statistics.

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.*

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 $x \neq 1$.

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 dare 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.

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

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.*

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.

Course Details

Learning Expectations

Materials/Texts

We will be using the book, Functions, Statistics, and Trigonometry by The University of Chicago School of Mathematics Project, everyday except review and test days. The book is a good book, though it is old and some of the symbolism and terminology is outdated. Select odd answers are in the back of the book. Students are encouraged to check their answers in the book as they go. This is to ensure they do not learn the steps incorrectly.

Course Content and Schedule:

Semester 1 (Quarter 1): Chapter 1, Chapter 2, Chapter 3, Final 1-3.

Semester 2 (Quarter 2): Chapter 4, Chapter 5, Chapter 6, Final 4-6.

Each test can be retaken once.

Differentiation/accessibility strategies and supports (TAG, ELL, SpEd, other):

Differentiation Strategies:

Students will be given tiered questions on a daily basis; we will be able to determine the level of difficulty they reach by how far they get in the assignment. Students will be able to learn the basics as well as to push themselves by finishing all of the assignment. Vocabulary will be available to all students for each unit. Vocabulary will be covered in the notes for each lesson as well as the most common mistakes made for each topic.

Safety issues and requirements (if applicable):

Classroom norms and expectations:

During full group zoom calls students will: -Mute when not talking

-Be respectful of others

-Turn video on when comfortable

In breakout rooms:

1) Have Mic On and Talk with each other

2) Turn Camera on when possible

3) Be respectful

4) Listen and help each other

5) Stay on task

Evidence of Course Completion

Assessment of Progress and Achievement:

90% Summative Assessment.

10% Formative Assignment.

Feedback: As students complete coursework, they will be given timely and specific feedback regarding their performance. ***It is imperative that they stay current with the coursework so they can get feedback in time for the tests.*** Students will receive this feedback through multiple forms. Comments on turned in work, auto-generated replies

when using an app, peer-to-peer review, and self-diagnosis based on a teacher generated answer key will all serve students as they improve their skills.

Assignment: With distance learning, virtually every assignment is homework. I do however provide practice problems for students to complete outside of class. I provide an answer key for these problems in the following class. It is very important for students to check

their answers for accuracy and understanding. Students should model their work after mine as I demonstrate what it looks like to have correct work.

Review and Basic Quizzes: I will provide students an opportunity to access documents that look very similar to a test format throughout each unit. They will complete work, take a picture of it, and submit that work via Canvas. These are opportunities to have students get their work examined by me and correct it if needed. Although most test reviews are comprehensive to that unit, students should also be reviewing any course material that was covered in that unit (or previous ones).

Tests: Students will take tests during the synchronous time we have during the week. Students will be permitted to work collaboratively on these tests with students who are also enrolled in my precalculus class and who are attending that day in our zoom call. Students will be sent to breakout rooms to collaborate. Students will complete the test in the allotted time that day and submit their work by the end of class by taking a picture of their hand-written work and uploading it to Canvas. If a student is absent, they can arrange a time to take a new version of that test with me. Students who miss a test will be given a zero until that test is made up. Students should make every effort to communicate about missing class and especially missing a test day to me. Students should make up tests in a timely manner (as soon as possible). In most cases, make up tests should happen within a week of when it was assigned.

Test Retakes: Test retakes are simply an opportunity to revisit the test. Students will have a chance to retake each test. This time will not be collaborative in nature and students should expect to work independently. The policy for test retakes follows the policy of testing in terms of missing class. Students should complete this in a timely manner and communicate with me regarding conflicts.

Communication: I make every attempt to work with students who may have a special circumstance for which I have not foreseen and created policy within this syllabus. The policies you see here are a guideline and should be discussed with me if it ends up applying to you. If there are barriers that are preventing your success in this course, I want to know about them so I can help you navigate towards successful completion of this course.

Progress Reports/Report Cards (what a grade means):

90-100% - A

80-89% - B

70-79% - C

60-69% - D

0-59% - F

Career Related Learning Experience (CRLEs) and Essential Skills:
Communication with Parent/Guardian
What methods are used to communicate curriculum, successes, concerns, etc.? Email: Kdenney@pps.net Text: 503-866-6003
Personal Statement and other needed info
Please keep in mind that attendance does not necessarily mean that the student was in the zoom class. It could be that they just had some time of contact for that day.