Arizona Mathematics

High School -- Precalculus

Reasoning with Functions and Relations (RFR)

A Analyze Functions (Standards within this strand encompass P.F-IF) RFR.AF

1. Interpret parameters of a function defined by an expression in the context of the situation. RFR.AF.1
2. Sketch the graph of a function that models a relationship between two quantities, identifying key features. RFR.AF.2
3. Interpret key features of graphs and tables for a function that models a relationship between two quantities in terms of the quantities. RFR.AF.3
4. Use limits to describe long-range behavior, asymptotic behavior, and points of discontinuity. RFR.AF.4
5. Sketch the graph of all six trigonometric functions, identifying key features. RFR.AF.5

B Building Functions (Standards within this strand encompass P.F-BF, P.F-TF) RFR.BF

1. Model relationships between quantities that require adding, subtracting, multiplying, and/or dividing functions RFR.BF.1
2. Model relationships through composition and attend to the restrictions of the domain. RFR.BF.2
3. Rewrite a function as a composition of functions. RFR.BF.3
4. Determine if a function has an inverse. If so, find the inverse. If not, define a restriction on the domain that meets the requirement for invertibility and find the inverse on the restricted domain. RFR.BF.4
5. Interpret the meanings of quantities involving functions and their inverses. RFR.BF.5
6. Verify by analytical methods that one function is the inverse of another. RFR.BF.6

C Interpreting Conics (Standards within this strand encompass P.G-GPE) RFR.IC

1. Model real-world situations which involve conic sections. RFR.IC.1
2. Identify key features of conic sections (foci, directrix, radii, axes, asymptotes, center) graphically and algebraically. RFR.IC.2
3. Sketch a graph of a conic section using its key features. RFR.IC.3
4. Use the key features of a conic section to write its equation. RFR.IC.4
5. Given a quadratic equation of the form ax2+ by2 + cx + dy + e = 0, determine if the equation is a circle, ellipse, parabola, or hyperbola. RFR.IC.5

D Interpreting Sequences and Series (Standards within this strand encompass P.F-BF.A.2, P.A-SSE.B.4)) RFR.ISS

1. Model real-world situations involving sequences or series using recursive and/or explicit definitions. RFR.ISS.1
2. Use covariational reasoning to describe sequences and series. RFR.ISS.2
3. Represent finite or infinite series using sigma notation. RFR.ISS.3
4. Find the sums of finite or infinite series, if they exist. RFR.ISS.4

Reasoning with Trigonometry

A Extended Triangle Trigonometry (Standards within this strand encompass P.G-SRT, P.F-TF.B) RT.ETT

1. Model real-world situations involving trigonometry. RFR.ETT.1
2. Apply the Law of Sines and Law of Cosines to solve problems. RFR.ETT.2
3. Use trigonometry to find the area of triangles. RFR.ETT.3
4. Use special triangles to determine geometrically the values of sine, cosine, tangent for $\pi/3$, $\pi/4$ and $\pi/6$, and use the unit circle to express the values of sine, cosine, and tangent for $\pi-x$, $\pi+x$, and $2\pi-x$ in terms of their values for x, where x is any real number. RFR.ETT.4
5. Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions. RFR.ETT.5
6. Use inverse functions to solve trigonometric equations utilizing real world context; evaluate the solution and interpret them in terms of context. RFR.ETT.6

B Reasoning with Trigonometric Structure (Standards within this strand encompass P.F-TF.C) RT.RTS

1. Use the structure of a trigonometric expression to identify ways to rewrite it. RT.RTS.1
2. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. RT.RTS.2
3. Solve trigonometric equations. RT.RTS.3

C Exploring Polar Equations RT.EPE

1. Graph polar equations. RT.EPE.1
2. Analyze and interpret the graphs of polar equations. RT.EPE.2
3. Use polar equations to solve problems. RT.EPE.3

Reasoning with Vectors

A Modeling with Parametrics RV.MP

1. Model real-world contexts with parametric equations. RV.MP.1
2. Use parametric equations to solve problems. RV.MP.2
3. Graph parametric equations and identify orientation. RV.MP.3
4. Analyze and interpret the graphs of parametric equations. RV.MP.4

B Exploring Vectors RV.EV

1. Recognize vector quantities as having both magnitude and direction. RV.EV.1
2. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes. RV.EV.2
3. Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point. RV.EV.3
4. Solve problems involving velocity and other quantities that can be represented by vectors. RV.EV.4
5. Add and subtract vectors, and multiply a vector by a scalar. RV.EV.5

Reasoning with Matrices

A Using Matrices (Standards within this strand encompass P.N-VM.C) RM.UM

1. Use matrices to represent and manipulate data. RM.UM.1
2. Use matrix operations to solve problems. Add, subtract, and multiply matrices of appropriate dimensions. Multiply matrices by scalars to produce new matrices. RM.UM.2
3. Find the inverse and determinant of a matrix. RM.UM.3
4. Use matrices to solve systems of linear equations. RM.UM.4