Course Competencies Math Concepts 201-114-VA

Representation two-dimensional geometric figures in the form of digital images:
2.1 Define what a vector is.
2.2 Represent a vector as a directed line segment.
2.3 Perform basic operations with vectors such as addition, subtraction, scalar multiplication.
2.4 For the sum and difference of two vectors, calculate and represent the resultant vector using the triangle method
and parallelogram method.
2.5 Express vectors as a linear combination of other vectors.
2.6 Calculate the dot product using the algebraic and geometric definitions.
2.7 Calculate the normal vectors of a vector.
2.8 Calculate the norm of a vector.
2.9 Determine the equation of a line given two points in the plane, a point and a slope, as well as a point and a direction vector.
2.10 Determine if two lines are parallel, perpendicular, or neither (using the dot product).
2.11 Calculate the point of intersection of two lines.
2.12 Calculate the shortest distance from a point to a line using projections.
2.13 Define what a matrix is.
2.14 Multiply a matrix, up to 3x3, by a vector.
2.15 Perform multiplication of two matrices up to 3x3.
2.16 Use matrices to perform rotational, translational, and homothetic transformations.
2.17 Proper order of transformations TRS (scaling first).
2.18 Concept of matrix inverse (no calculation).
2.19 Apply the properties of inverse matrices.
2.20 Find the transpose of a matrix.
2.21 Apply an affine transformation

Process quantitative data using descriptive statistics:
4.1 Organize raw data using a frequency table.
4.2 Construct histograms, relative frequency histograms, and ogives.
4.3 Interpret graphs in the context of the data setting.
4.4 Compute the mean, median, and mode from raw data.
4.5 Interpret the mean and median.
4.6 Explain how the mean and median can be affected by outliers.
4.7 Compute a trimmed mean and a weighted average.
4.8 Calculate the range, variance and standard deviation.