Quiz 1 Corrections:

1. To convert vector a = [−7, 0, 3] into a vector of unit length, u, all the elements need to be divided by the length of the vector, which is  (please provide your answer rounded to 2 decimal places)

Ans.

Compute magnitude of the vector

||a|| = sqrt((-7)^2 + 0^2 + 3^2) = sqrt(49 + 0 + 9) = sqrt(58) = 7.61

Unit length of the vector is given by

u = a / ||a||

u1 = (-7) / sqrt(58) = -0.919

u2 = 0 / sqrt(58) = 0.00

u3 = 3 / sqrt(58) = 0.393

u = [-0.92, 0.00, 0.39]

Reference of the answer: [Expert Maths Tutoring in the UK - Boost Your Scores with Cuemath](https://www.cuemath.com/calculus/unit-vector/)

1. PCA can be used for dimensionality reduction of data with a covariance matrix defined as [2 0 0 0 0

0 4 0 0 0

0 0 4 0 0

0 0 0 9 0

0 0 0 0 3]

Ans.

PCA can be used for dimensionality reduction of data, therefore the statement is true. And the covariance matrix mentioned in the answer is also correct.

Reference for the above answer: [Principal Component Analysis (PCA) Explained | Built In](https://builtin.com/data-science/step-step-explanation-principal-component-analysis)