2. Both Linear Autoencoders (AEs) and Principal Component Analysis (PCA) are methods used to reduce data to fewer dimensions. They both rely on linear transformations. A Linear Autoencoder works by shrinking the data and then trying to recreate it, aiming to minimize the error during this process. PCA, on the other hand, reduces dimensions by finding patterns (called principal components) that explain the most variation in the data. Without nonlinear activation functions, a Linear Autoencoder acts very much like PCA, but PCA is often faster when doing simpler linear reductions.

4. A Convolutional Autoencoder (CNN AE) performs better than a Dense Autoencoder for images because it can capture important spatial features, resulting in more accurate image reconstructions and lower error (measured as Mean Squared Error or MSE).

5. An Autoencoder designed for image denoising works better than a basic CNN Autoencoder because it can handle noisy input data and still reconstruct images well.

6. The Image Denoising AE performs better than the Vanilla CNN AE because it learns to remove noise, making it more robust and preventing overfitting. Adding noise forces the model to generalize and focus on important features, while the Vanilla CNN AE may overfit to specific training data, making it less effective on unseen or noisy images.

7. Variational Autoencoders (VAEs) are different from regular AEs because they create a probabilistic space, allowing them to generate new data, while regular AEs focus only on recreating the input.