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2.6.1 Additional Homework

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Homework 2.6.1.1

4/4 points (graded)

Suppose a professor decides to assign grades based on two exams and a final. Either all three exams (worth 100 points each) are equally weighted or the final is double weighted to replace one of the exams to benefit the student. The records indicate each score on the first exam as χ_0 , the score on the second as χ_1 , and the score on the final as χ_2 . The professor transforms these scores and looks for the maximum entry. The following describes the linear transformation:

$$l\left(\begin{pmatrix} \chi_0 \\ \chi_1 \\ \chi_2 \end{pmatrix}\right) = \begin{pmatrix} \chi_0 + \chi_1 + \chi_2 \\ \chi_0 + 2\chi_2 \\ \chi_1 + 2\chi_2 \end{pmatrix}$$

What is the matrix that corresponds to this linear transformation?

☐ $\begin{pmatrix} 1 & 1 \\ 1 & 2 \\ 1 & 2 \end{pmatrix}$

☐ $\begin{pmatrix} 1 & 1 & 1 \\ 2 & 0 & 1 \\ 0 & 2 & 1 \end{pmatrix}$

☒ $\begin{pmatrix} 1 & 1 & 1 \\ 1 & 0 & 2 \\ 0 & 1 & 2 \end{pmatrix}$ ✓

If a student's scores are $l\left(\begin{pmatrix} 68 \\ 80 \\ 95 \end{pmatrix}\right) = \begin{pmatrix} \psi_0 \\ \psi_1 \\ \psi_2 \end{pmatrix}$ $\psi_0 =$

243

✓ Answer: 243 $\psi_1 =$

258

✓ Answer: 258 $\psi_2 =$

270

✓ Answer: 270

Explanation

Answer:
$$\begin{pmatrix} 1 & 1 & 1 \\ 1 & 0 & 2 \\ 0 & 1 & 2 \end{pmatrix}$$

If a student's scores are $\begin{pmatrix} 68 \\ 80 \\ 95 \end{pmatrix}$, what is the transformed score?

Answer:
$$\begin{pmatrix} 243 \\ 258 \\ 270 \end{pmatrix}$$

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i Answers are displayed within the problem