Congratulations! You passed!

Grade received 80%

Latest Submission Grade 80% To pass 80% or higher

Go to next item

1 / 1 point

1.	In terms of the \hat{x}_s , \hat{y}_s , \hat{z}_s coordinates of a fixed space frame {s}, the frame {a} has its \hat{x}_a -axis pointing in the
	direction $(0,0,1)$ and its \hat{y}_a -axis pointing in the direction $(-1,0,0)$, and frame $\{b\}$ has its \hat{x}_b -axis pointing in
	the direction $(1,0,0)$ and its \hat{y}_b -axis pointing in the direction $(0,0,-1)$. The origin of {a} is at $(0,0,1)$ in {s}
	and the origin of {b} is at $(0,2,0)$. Draw the {s}, {a}, and {b} frames, similar to examples in the book and videos,
	for easy reference in this question and later questions.

Write the transformation matrix T_{sa} . All elements of this matrix should be integers.

Enter your matrix in the answer box (just modify the matrix already shown there) and click "Run." Your answer will not be evaluated until you submit the quiz.

$$\begin{bmatrix} 1 & 2 & 3 & 4 \\ 5 & 6 & 7 & 8 \\ 9 & 10 & 11 & 12 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

1	[[0,-1,0,0],[6	0,0,-1,0],[1,0,	0,1],[0,0,0,1]]

Run Reset



Good job!

2. Referring back to Question 1, write ${\cal T}_{sb}^{-1}$. All elements of this matrix should be integers.

1 / 1 point

Enter your matrix in the answer box (just modify the matrix already shown there) and click "Run." Your answer will not be evaluated until you submit the quiz.

$$\begin{bmatrix} 1 & 2 & 3 & 4 \\ 5 & 6 & 7 & 8 \\ 9 & 10 & 11 & 12 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

$$1 \qquad \big[\big[[1,\theta,\theta,\theta], [\theta,\theta,-1,\theta], [\theta,1,\theta,-2], [\theta,\theta,\theta,1] \big] \big]$$

Run



3. Referring back to Question 1, write T_{ab} . All elements of this matrix should be integers.

1 / 1 point

Enter your matrix in the answer box (just modify the matrix already shown there) and click "Run." Your answer will not be evaluated until you submit the quiz.

$$\begin{bmatrix} 1 & 2 & 3 & 4 \\ 5 & 6 & 7 & 8 \\ 9 & 10 & 11 & 12 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

Run



4. Referring back to Question 1, let $T=T_{sb}$ be considered as a transformation operator consisting of a rotation about \hat{x} by -90° and a translation along \hat{y} by 2 units. Calculate $T_1=TT_{sa}$, and think of T_{sa} as the representation of the initial configuration of [a] relative to [s], T as a transformation operation, and T_1 as the new configuration of [a] after performing the transformation. Are the rotation axis \hat{x} and translation axis \hat{y} of the transformation T properly considered to be expressed in the frame [s] or the frame [a]?

1 / 1 point



O The frame {a}.



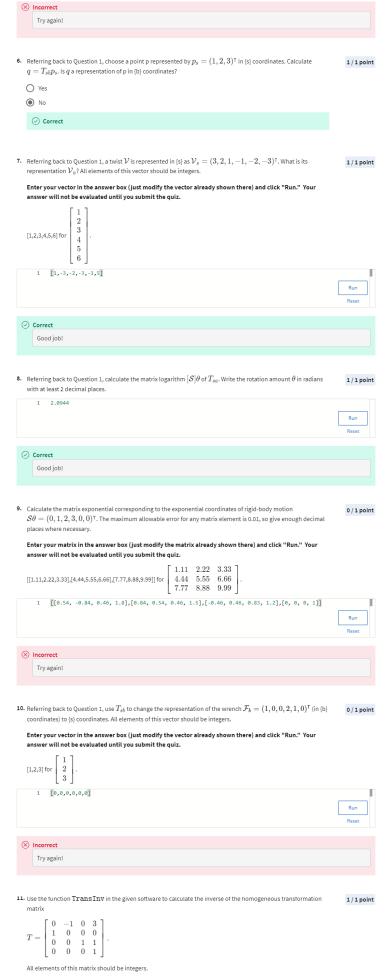
5. Referring back to Question 1, use T_{sb} to change the representation of the point $p_b=(1,2,3)^\intercal$ (in [b] coordinates) to (s) coordinates. All elements of this vector should be integers.

0 / 1 point

Enter your vector in the answer box (just modify the vector already shown there) and click "Run." Your answer will not be evaluated until you submit the quiz.

$$\begin{bmatrix} 1,2,3 \end{bmatrix}$$
 for $\begin{bmatrix} 1\\2\\3 \end{bmatrix}$

Run



Enter your matrix in the answer box (just modify the matrix already shown there) and click "Run." Your answer will not be evaluated until you submit the quiz.

