HW7

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March 2021

1. Any three-dimensional affine transformation can be represented with a 4 ×4 matrix. Match each of the matrices below to exactly one of the following transformations :

   - Differential (Non-Uniform) Scaling
   - Reflection
   - Rotation about the z-axis with non-uniform scaling
   - Rotation about the y-axis with non-uniform scaling
   - Translation
   - Rotation about the x-axis
   - Rotation about the y-axis
   - Rotation about the z-axis
   - Shearing along z with respect to the x-y plane (z=0 plane unchanged by shear)
   - Shearing along x with respect to the y-z plane (x=0 plane unchanged by shear)
   - Rotation about the x-axis and translation
   - Uniform scaling
   - Reflection with non-uniform scaling

   A: Translation
   B: Rotation about the x-axis
   C: Rotation about the z-axis
   D: Uniform scaling
   E: Differential (Non-Uniform) Scaling
   F: Shearing along x with respect to the y-z plane (x=0 plane unchanged by shear)
   G: Reflection
   H: Shearing along z with respect to the x-y plane (z=0 plane unchanged by shear) and Shearing along x with respect to the y-z plane (x=0 plane unchanged by shear)
   Or if changed H[1][1] and H[3][3] to 0, it is a rotation about the y-axis

I: Rotation about the x-axis and translation

2. What will be the new position of the given point (–6, 8) after rotating 90° clockwise about the origin?
   (d) (8,6)

3. What will be the new position of the given point (7, 4) after translation of 2 units left and 4 units up?
   (a) (5,8)

4. What will be the new position of the given point (0, 6) after translation of 6 units down and 3 units right?
   (b) (3,0)

5. What will be the new position of the given point (–8, –2) after rotating 180° about the origin?
   (a) (8, 2)