1. Find the reflection of the triangle $HOT$ over the $x$-axis. Write the coordinates of $H'O'T'$. Is the image similar or congruent? How do you know?

$H (0,0) \rightarrow H' (0,0)$
$O (4,4) \rightarrow O' (4,4)$
$T (6,2) \rightarrow T' (6,-2)$

2. Find the reflection of the quadrilateral $WXYZ$ across the dotted line.

What is the equation of the dotted line?

$X = -2$

Label the image $W' X' Y' Z'$.

$W (0,0) \rightarrow W' (-4,0)$
$X (2,2) \rightarrow X' (-6,2)$
$Y (2,-1) \rightarrow Y' (-6,-1)$
$Z (0,-3) \rightarrow Z' (-4,-3)$
3. The table below shows the coordinates of triangle \( PQR \).

<table>
<thead>
<tr>
<th>Triangle ( PQR )</th>
<th>Triangle ( P'Q'R' )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( P ) (-3, 2)</td>
<td>( P' ) (3, 2)</td>
</tr>
<tr>
<td>( Q ) (-3, 6)</td>
<td>( Q' ) (3, 6)</td>
</tr>
<tr>
<td>( R ) (-7, 7)</td>
<td>( R' ) (7, 7)</td>
</tr>
</tbody>
</table>

**Part A**

Fill in the table above for the coordinates of \( P', Q' \), and \( R' \) after a reflection over the \( y \)-axis.

**Part B**

On the grid below, draw triangle \( PQR \) and triangle \( P'Q'R' \).

**Part C**

On the lines below, explain how you determined the location of \( R' \):

1. I used the rule \( (x, y) \rightarrow (-x, y) \) so \( R(-7, 7) \rightarrow R'(7, 7) \)

or

1. I counted 7 units to the right of the \( y \)-axis because \( R \) and \( R' \) need to be equal distance away so \( R'(7, 7) \)
4. Triangle $XYZ$ has vertices $X(2, 1)$, $Y(6, 1)$, and $Z(4, 4)$.

On the graph, draw the image of triangle $XYZ$ after a translation two to the left. Label the image $X''Y''Z''$.

Now create triangle $X''Y''Z''$ by reflecting triangle $X'Y'Z'$ over the $x$-axis. What will be the coordinates of triangle $X''Y''Z''$? Is the new image similar or congruent?

- $X''(0, -1)$
- $Y''(4, -1)$
- $Z''(2, -4)$

5. Describe a reflection that would move shape 1 to match shape 2.

- $y$-axis reflection
- or line $x = 0$
6. Refer to the grid below:

a) Describe how you could move shape 1 to exactly match shape 2 by using one translation and one reflection.

\[ \text{Reflect then translate } \Rightarrow x \text{ axis reflection w/ rule } (x, y) \rightarrow (x + 12, y - 3) \]

\[ \text{Translate then reflect } \Rightarrow (x, y) \rightarrow (x + 12, y - 3) \]

then \( x \) axis reflection

b) Are there other sequences of transformations that would move shape 1 to exactly match shape 2? If so, describe the steps you would perform.

7. Solve & check

\[ -2(m - 30) = -6m \]
\[ -2m + 60 = -6m \]
\[ +6m \]
\[ 4m = -60 \]
\[ m = -15 \]
\[ -2(-15 - 30) = -6m \]
\[ -2(-45) \]
\[ 90 = -6m \]
\[ \frac{90}{-6} = m \]
\[ -15 = m \checkmark \]

8. Solve

\[ 8a - 22 = 3(3a + 11) - a \]
\[ 8a - 22 = 9a + 33 - a \]
\[ 8a - 22 = 8a + 33 \]
\[ -8a \]
\[ -8a \]
\[ -22 = 33 \]
\[ \emptyset \]