Transformations

Answers to test question 21C. Tell whether each picture shows a translation, reflection or rotation.

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Answer:</td>
<td>Answer:</td>
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<tr>
<td><strong>Translation.</strong></td>
<td><strong>Rotation.</strong></td>
</tr>
<tr>
<td>A translation is also called a slide. It is the movement of a figure in a straight line. The movement may be horizontal, vertical or diagonal.</td>
<td>The figure shown here is turned 360°. A rotation may be turned any number of degrees up to 360°.</td>
</tr>
</tbody>
</table>

A **translation** is the sliding of a figure along a straight line. The figure may be moved horizontally, vertically or diagonally.

A **reflection**, also called a flip, is flipping a figure over a line to show a mirror image of the figure.

A **rotation** or a turn, is the turning of a figure around a point. This figure is turned 90° clockwise.

Directions: Write translation, reflection or rotation.

1. ________________ 2. ________________ 3. ________________ 4. ________________

5. ________________ 6. ________________ 7. ________________ 8. ________________
Transformations
Directions: Write translation, reflection or rotation.

9. ___________________ 10. ___________________ 11. ___________________ 12. ___________________

13. ___________________ 14. ___________________ 15. ___________________ 16. ___________________

17. ___________________ 18. ___________________ 19. ___________________ 20. ___________________

21. ___________________ 22. ___________________ 23. ___________________ 24. ___________________

25. ___________________ 26. ___________________ 27. ___________________ 28. ___________________
Geometry: Skill 5-21C

Transformations

Directions: How was each rotation below moved. Write clockwise or counterclockwise. Then write 90°, 180° or 270°.

29. 30. 31.

Answer: counterclockwise 90°

32. 33. 34.

35. 36. 37.

38. 39. 40.

41. 42. 43.
Combining Transformations

Directions: Write the combination of transformations. The first one is done for you.

44. reflection, rotation

45.

46.

47.

48.

49.

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Combining Transformations

Directions: Write the combination of transformations.

50. 

51. 

52. 

53. 

54. 

55. 

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Combining Transformations

Directions: Write the combination of transformations.

56. Graph a triangle with the vertices below.
(9,7), (9,9), (7,7)

Graph the triangle with the new vertices to show the transformations and write translation, reflection or rotation.

(5,5), (5,7), (3,5) translation

(5,3), (5,5), (3,5) reflection

57. Graph a triangle with vertices below.
(1,1), (3,1), (1,4)

Graph the triangle with the new vertices to show the transformations.

(4,4), (6,4), (4,7) _________________________

(4,7), (7,7), (7,9) _________________________

58. Graph a triangle with vertices below.
(1,5), (1,9), (3,5).

Graph the triangle with the new vertices to show the transformations.

(4,5), (6,5), (6,9) _________________________

(6,5), (6,1), (8,1) _________________________

59. Graph a triangle with vertices below.
(2,1), (4,1), (2,3).

Graph the triangle with the new vertices to show the transformations.

(4,4), (6,4), (4,6) _________________________

(6,4), (8,4), (8,6) _________________________
Combining Transformations

Directions: Write the combination of transformations.

60. Graph a triangle with the vertices below.  
   (1,3), (2,5), (3,3)

Graph the triangle with the new vertices to show the transformations and write translation, reflection or rotation.

(4,7), (5,9), (6,7)  
(6,7), (6,5), (8,6)

61. Graph a triangle with vertices below.  
   (1,3), (3,3), (3,7)

Graph the triangle with the new vertices to show the transformations.

(4,3), (6,3), (4,7)  
(8,6), (8,10), (10,6)

62. Graph a parallelogram with vertices below.  
   (2,9), (1,6), (4,6), (5,9)

Graph the parallelogram with the new vertices to show the transformations.

(5,9), (6,6), (9,6), (8,9)  
(6,1), (5,4), (8,4), (9,1)

63. Graph a triangle with vertices below.  
   (1,1), (1,3), (5,3).

Graph the triangle with the new vertices to show the transformations.

(5,3), (5,7), (3,7)  
(5,3), (5,7), (7,7)
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<tr>
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<tbody>
<tr>
<td>1</td>
<td>translation</td>
<td>2</td>
<td>reflection</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>reflection</td>
<td>5</td>
<td>translation</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>translation</td>
<td>7</td>
<td>translation</td>
<td>8</td>
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<tr>
<td>9</td>
<td>rotation</td>
<td>10</td>
<td>translation</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>rotation</td>
<td>12</td>
<td>reflection</td>
<td>13</td>
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<tr>
<td>14</td>
<td>reflection</td>
<td>15</td>
<td>translation</td>
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<td>16</td>
<td>rotation</td>
<td>17</td>
<td>rotation</td>
<td>18</td>
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<td>19</td>
<td>translation</td>
<td>20</td>
<td>rotation</td>
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<tr>
<td>21</td>
<td>translation</td>
<td>22</td>
<td>reflection</td>
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<tr>
<td>24</td>
<td>translation</td>
<td></td>
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<tr>
<td>25</td>
<td>reflection</td>
<td>26</td>
<td>rotation</td>
<td>27</td>
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<tr>
<td>28</td>
<td>translation</td>
<td></td>
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</tr>
<tr>
<td>29</td>
<td>counterclockwise 90°</td>
<td>30</td>
<td>clockwise 180°</td>
<td>31</td>
</tr>
<tr>
<td>32</td>
<td>counterclockwise 90°</td>
<td>33</td>
<td>counterclockwise 180°</td>
<td>34</td>
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<tr>
<td>35</td>
<td>clockwise 180°</td>
<td>36</td>
<td>counterclockwise 90°</td>
<td>37</td>
</tr>
<tr>
<td>38</td>
<td>clockwise 90°</td>
<td>39</td>
<td>counterclockwise 90°</td>
<td>40</td>
</tr>
<tr>
<td>41</td>
<td>counterclockwise 180°</td>
<td>42</td>
<td>counterclockwise 180°</td>
<td>43</td>
</tr>
<tr>
<td>44</td>
<td>reflection, rotation</td>
<td>45</td>
<td>translation, rotation</td>
<td>46</td>
</tr>
<tr>
<td>47</td>
<td>reflection, translation</td>
<td>48</td>
<td>rotation, translation</td>
<td>49</td>
</tr>
<tr>
<td>50</td>
<td>translation, rotation</td>
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<td>rotation, translation</td>
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56. Graph a triangle with the vertices below.
   (9,7), (9,9), (7,7)

Graph the triangle with the new vertices to show the transformations and write translation, reflection or rotation.

(5,5), (5,7), (3,5) translation
(5,3), (5,5), (3,5) reflection

57. Graph a triangle with vertices below.
   (1,1), (3,1), (1,4)

Graph the triangle with the new vertices to show the transformations.

(4,4), (6,4), (4,7) translation
(4,7), (7,7), (7,9) rotation

58. Graph a triangle with vertices below.
   (1,5), (1,9), (3,5).

Graph the triangle with the new vertices to show the transformations.

(4,5), (6,5), (6,9) reflection
(6,5), (6,1), (8,1) rotation

59. Graph a triangle with vertices below.
   (2,1), (4,1), (2,3).

Graph the triangle with the new vertices to show the transformations.

(4,4), (6,4), (4,6) translation
(6,4), (8,4), (8,6) reflection
### Combining Transformations

**Directions:** Write the combination of transformations.

#### 60. Graph a triangle with the vertices below.
(1,3), (2,5), (3,3)

Graph the triangle with the new vertices to show the transformations and write translation, reflection or rotation.

- (4,7), (5,9), (6,7) **translation**
- (6,7), (6,5), (8,6) **rotation**

#### 61. Graph a triangle with vertices below.
(1,3), (3,3), (3,7)

Graph the triangle with the new vertices to show the transformations.

- (4,3), (6,3), (4,7) **reflection**
- (8,6), (8,10), (10,6) **translation**

#### 62. Graph a parallelogram with vertices below.
(2,9), (1,6), (4,6), (5,9)

Graph the parallelogram with the new vertices to show the transformations.

- (5,9), (6,6), (9,6), (8,9) **reflection**
- (6,1), (5,4), (8,4), (9,1) **translation**

#### 63. Graph a triangle with vertices below.
(1,1), (1,3), (5,3)

Graph the triangle with the new vertices to show the transformations.

- (5,3), (5,7), (3,7) **rotation**
- (5,3), (5,7), (7,7) **reflection**