Transformations and Rigid Motions

Translations, reflections, rotations, dilations, and rigid-motion ideas.

Name _____ Date _____

32 main · 2-up grid · 3 pages

Completion Reward

Shown here as a small pack artifact, not a preview destination.

1. A segment of length 7 is rotated. What is its image length?

A. 14
B. 7
C. 3.5
D. It depends on the angle.

2. If an angle measures 58 degrees before a rigid motion, what is its image measure?

A. 116 degrees
B. 29 degrees
C. 58 degrees
D. It depends on the motion.

3. Which transformation is a rigid motion?

A. Dilation by factor 2
B. Translation
C. Stretch in only one direction
D. Resize by 50%

4. What is always true after a sequence of rigid motions?

A. The image must get larger.
B. The image is congruent to the original.
C. The orientation must stay the same.
D. The coordinates must all stay positive.

5. Which statement about a rotation is true?

A. It preserves distance from the center of rotation.
B. It always changes orientation.
C. It changes every segment length.
D. It always sends x to -x.

6. Which transformation is not a rigid motion?

Rigid motions preserve size and shape, but a dilation changes scale even when it keeps points on the same rays.

A. Translation
B. Rotation
C. Reflection
D. Dilation

7. Which transformation reverses orientation?

A. Reflection
B. Translation
C. Rotation
D. A composition of translations

8. Which transformation changes size but preserves shape?

A. Dilation
B. Rotation
C. Reflection
D. Translation

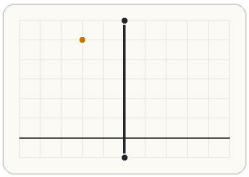
9. Which transformation maps the line x = 2 to the line x = -2?

A. Reflection across the y-axis
B. Reflection across the x-axis
C. Translation up 2
D. Rotation 180 degrees about (2, 0)

10. Which point stays fixed under reflection across the y-axis?

A. (3, 0)
B. (2, 2)
C. (0, 3)
D. (-4, 1)

11. Point P(-2, 5) is reflected across the y-axis. Which ordered pair is the image?



A reflection across the y-axis reverses the sign of x and keeps y unchanged.

A. (-2, -5)
B. (5, -2)
C. (2, 5)
D. (2, -5)

12. What is the image of (4, -2) after a reflection across the x-axis?

A. (4, 2)
B. (-4, -2)
C. (-4, 2)
D. (2, 4)

13. What is the image of (-3, 5) after a reflection across the y-axis?

A. (-3, -5)
B. (5, -3)
C. (3, 5)
D. (3, -5)

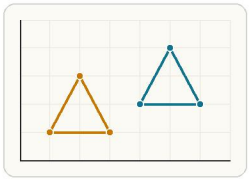
14. Rotate (-2, 4) 180 degrees about the origin.

A. (-4, 2)
B. (4, -2)
C. (2, 4)
D. (2, -4)

15. Point P is at (2, -1). A translation sends every point right 3 and up 4. Where is P'?

A. (-1, 3)
B. (5, -5)
C. (5, 3)
D. (1, 3)

16. Which transformation maps triangle ABC to triangle A'B'C' on the grid?



A translation shifts each point by the same distance in the same direction.

A. Reflection across the x-axis
B. Rotation about the origin
C. Dilation
D. Translation

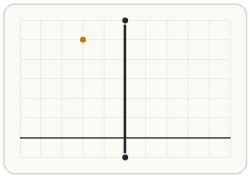
17. A figure will be dilated from the origin by a scale factor of 1/2. What should happen to each coordinate?

A. Add 1/2 to both coordinates.
B. Subtract 1/2 from both coordinates.
C. Multiply both coordinates by 1/2.
D. Switch the coordinates.

18. If you want to show two figures are congruent using transformations, what must you check?

A. Their side lengths add to the same total.
B. A sequence of rigid motions maps one figure exactly onto the other.
C. One figure can be stretched to fit the other.
D. Their areas are both positive.

19. A student says reflecting (-2, 5) across the x-axis gives (2, -5). What is the mistake?



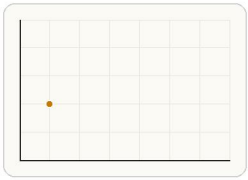
Across the x-axis, the y-coordinate changes sign while the x-coordinate stays the same.

A. Both coordinates should stay the same.
B. The x-coordinate should stay -2; only the y-coordinate changes sign.
C. The y-coordinate should become 5, not -5.
D. A reflection across the x-axis doubles both coordinates.

20. A student says translating (2, 3) by (4, -1) gives (6, 4). What is the mistake?

A. The student added 1 instead of subtracting 1 from y.
B. The student should have subtracted 4 from x.
C. Translations cannot use negative numbers.
D. The x-coordinate should stay 2.

21. Point A is at (1, 2). Translate it 4 units right and 1 unit down. Where is A'? Answer as an ordered pair.



A translation adds to one coordinate and subtracts from the other according to the direction.

22. What is the composition of two reflections across parallel lines?

A. A dilation
B. A single reflection
C. A translation
D. A shear

23. A dilation sends P(2, 1) to P'(6, 3) with center at the origin. What is the scale factor?

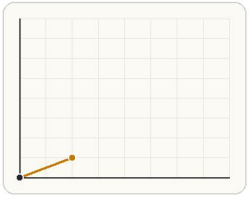
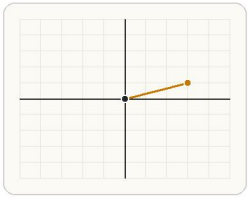


Image coordinates scale away from the origin by the dilation factor.

A. 2
B. 1/3
C. 3
D. 4

24. Point Q(3, 1) is rotated 90 degrees counterclockwise about the origin. Which ordered pair is the image?



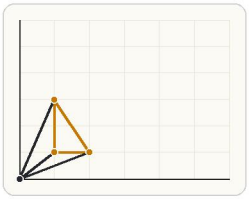
Rotations keep distance from the origin while changing direction.

A. (1, 3)
B. (-3, -1)
C. (-1, 3)
D. (3, -1)

25. **Rotate the point (2, -1) 90 degrees counterclockwise about the origin.**

A. (1, 2)
B. (-1, -2)
C. (-2, 1)
D. (2, 1)

26. **A student says a dilation preserves all side lengths. What is wrong?**



A dilation changes size by a scale factor but keeps corresponding points on the same rays from the center.

A. A dilation preserves angle measure, but it changes lengths by a scale factor.
B. A dilation changes angle measure but preserves lengths.
C. A dilation only works on circles.
D. A dilation is the same as a translation.

27. **A segment of length 3 is dilated by a scale factor of 4. What is the image length? Answer with a number.**

28. **A polygon has perimeter 8. After a dilation with scale factor 3, what is the new perimeter? Answer with a number.**

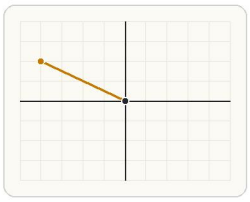
29. **Student A says rotating (1, 4) 90 degrees clockwise about the origin gives (4, -1). Student B says it gives (-4, 1). Who is correct?**

A. Student B
B. Both students
C. Neither student
D. Student A

30. **Which explanation best justifies that a figure and its rotated image are congruent?**

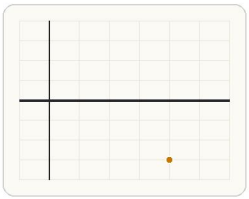
A. Rotation is a rigid motion, so it preserves side lengths and angle measures.
B. The image looks the same size on the page.
C. The coordinates all stay positive.
D. Rotations always move figures upward.

31. **Point R is at (-4, 2). After a 180-degree rotation about the origin, where is R'? Answer as an ordered pair.**



A 180-degree rotation about the origin sends (x, y) to (-x, -y).

32. **Point S is at (4, -3). Reflect it across the x-axis. Where is S'? Answer as an ordered pair.**



Across the x-axis, the sign of y changes while x stays fixed.