G.G.54: Rotations: Define, investigate, justify, and apply isometries in the plane (rotations, reflections, translations, glide reflections)

1. If the letter \( P \) is rotated 180 degrees, which is the resulting figure?
   1) \( \text{d} \)
   2) \( \text{a} \)
   3) \( \text{c} \)
   4) \( \text{b} \)

2. What are the coordinates of \( A' \), the image of \( A(-3, 4) \), after a rotation of 180º about the origin?
   1) \((4, -3)\)
   2) \((-4, -3)\)
   3) \((3, 4)\)
   4) \((3, -4)\)

3. If point \((5, 2)\) is rotated counterclockwise 90º about the origin, its image will be point
   1) \((2, 5)\)
   2) \((2, -5)\)
   3) \((-2, 5)\)
   4) \((-5, -2)\)

4. What are the coordinates of \( M' \), the image of \( M(2, 4) \), after a counterclockwise rotation of 90º about the origin?
   1) \((-2, 4)\)
   2) \((-2, -4)\)
   3) \((-4, 2)\)
   4) \((-4, -2)\)

5. What is the image of point \((8, -4)\) under the rotation \( R_{90^\circ} \) about the origin?
   1) \((8, 4)\)
   2) \((4, 8)\)
   3) \((-4, 8)\)
   4) \((-4, -8)\)

6. The transformation \( R_{90^\circ} \) maps point \((5, 3)\) onto the point whose coordinates are
   1) \((5, -3)\)
   2) \((3, -5)\)
   3) \((3, 5)\)
   4) \((-3, 5)\)

7. What is the image of \( A(5, 2) \) under \( R_{90^\circ} \)?
   1) \((-5, 2)\)
   2) \((5, -2)\)
   3) \((2, 5)\)
   4) \((-2, 5)\)

8. The coordinates of point \( P \) are \((7, 1)\). What are the coordinates of the image of \( P \) after \( R_{90^\circ} \) about the origin?
   1) \((1, 7)\)
   2) \((-7, -1)\)
   3) \((1, -7)\)
   4) \((-1, 7)\)

9. What are the coordinates of the image of \( P(-2, 5) \) after a clockwise rotation of 90º about the origin?
   1) \((-5, -2)\)
   2) \((-2, -5)\)
   3) \((2, 5)\)
   4) \((5, 2)\)
10. What are the coordinates of the image of \((2, -5)\) after a counterclockwise rotation of 90° about the origin?
   1) \((-2, 5)\)
   2) \((2, 5)\)
   3) \((-5, -2)\)
   4) \((5, 2)\)

11. The accompanying diagram shows the starting position of the spinner on a board game. How does this spinner appear after a 270° counterclockwise rotation about point \(P\)?
   1)
   2)
   3)
   4)

12. What is the image of the point \((-3, -6)\) on rotation of 90° about the origin?

13. What is the image of the point \((2, -3)\) under a clockwise rotation of 90° \((R_{-90°})\) about the origin?

14. The point \((-2, 1)\) is rotated 180° about the origin in a clockwise direction. What are the coordinates of its image?

15. What is the image of \(R_{90°}(1, 2)\)?

16. Write the coordinates of \(P'\), the image of \(P(5, -1)\) after a clockwise rotation of 180° about the origin.

17. What is the image of \((5, 1)\) under a counterclockwise rotation of 90°?

18. The point \((-3, 4)\) is rotated 180° about the origin in a counterclockwise direction. What are the coordinates of its image?

19. What is the image of \((6, 5)\) under a counterclockwise rotation of 180°?

20. Point \(A\) is rotated 180° in a counterclockwise direction about the origin. If the coordinates of \(A\) are \((-1, 3)\), what are the coordinates of \(A'\), its image?

21. If point \(P(3, -2)\) is rotated 90° about the origin, what is the image of \(P\)?
22. The coordinates of the vertices of \( \triangle RST \) are \( R(-2, 3), S(4, 4), \) and \( T(2, -2) \). Triangle \( R'S'T' \) is the image of \( \triangle RST \) after a rotation of 90° about the origin. State the coordinates of the vertices of \( \triangle R'S'T' \). [The use of the set of axes below is optional.]

23. The coordinates of the vertices of \( \triangle ABC \) are \( A(1, 2), B(-4, 3), \) and \( C(-3, -5) \). State the coordinates of \( \triangle A'B'C' \), the image of \( \triangle ABC \) after a rotation of 90° about the origin. [The use of the set of axes below is optional.]
G.G.54: Rotations: Define, investigate, justify, and apply isometries in the plane (rotations, reflections, translations, glide reflections)

Answer Section

1. ANS: 1
   REF: 068517siii

2. ANS: 4
   \((x, y) \rightarrow (-x, -y)\)
   REF: 061304ge

3. ANS: 3
   REF: 060809b

4. ANS: 3
   REF: 088534siii

5. ANS: 2
   REF: 010435siii

6. ANS: 4
   REF: 089421siii

7. ANS: 4
   REF: 019727siii

8. ANS: 4
   REF: 011421ge

9. ANS: 4
   REF: 019934siii

10. ANS: 4
    REF: 080328siii

11. ANS: 3
    REF: 080721a

12. ANS: (6, -3)
    REF: 068016siii

13. ANS: (-3, -2)
    REF: 068109siii

14. ANS: (2, -1)
    REF: 068703siii

15. ANS: (-2, 1)
    REF: 089308siii

16. ANS: (-5, 1)
    REF: 018905siii

17. ANS: (-1, 5)
    REF: 068910siii

18. ANS: (3, -4)
    REF: 069605siii
19 ANS: 
\((-6, -5)\)

REF: 089812siii

20 ANS: 
\((1, -3)\)

REF: 089908siii

21 ANS: 
\((2, 3)\)

REF: 080109siii

22 ANS: 
\(R'(-3, -2), S'(-4, 4), \text{ and } T'(2, 2).\)

REF: 011232ge

23 ANS: 
\(A'(-2, 1), B'(-3, -4), \text{ and } C'(5, -3)\)

REF: 081230ge