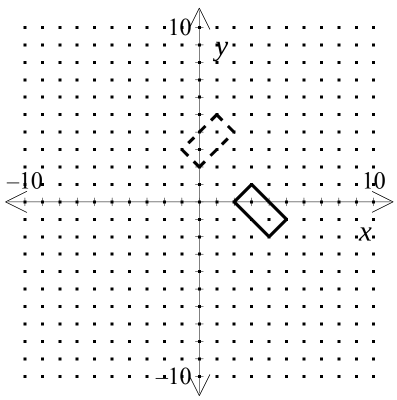
NAME:______________________________

1. Rectangle *ABCD* has vertices $A(0, -4)$, $B(4, -2)$, $C(5, -4)$, and $D(1, -6)$. Find the coordinates of the vertices of $A'B'C'D'$, the image of *ABCD* after a rotation of 180° about the origin.

[1] ______________________________

2. Describe the graph below.



[A] The dotted quadrilateral is the image of the solid quadrilateral under a rotation 180° about the origin.

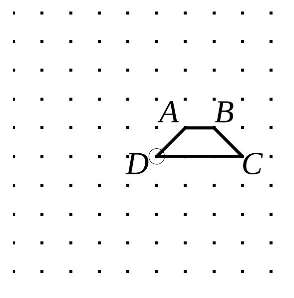
[B] The dotted quadrilateral is the image of the solid quadrilateral under a rotation 90° clockwise about the origin.

[C] The dotted quadrilateral is the image of the solid quadrilateral under a rotation 270° counterclockwise about the origin.

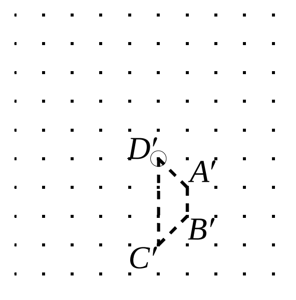
[D] The dotted quadrilateral is the image of solid quadrilateral under a rotation 90° counterclockwise about the origin.

[2] ______

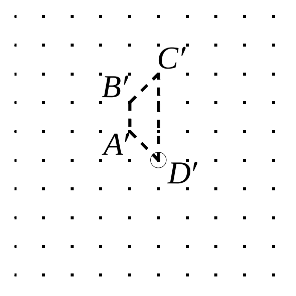
3. Draw the rotation image of the figure for a rotation of 180° around turning point *D*.



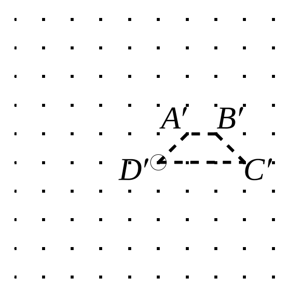
[A]



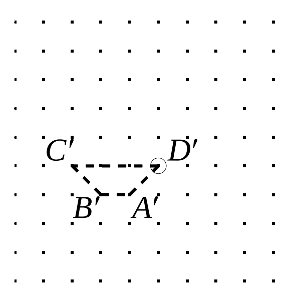
[B]



[C]



[D]



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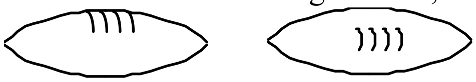
[3] ______

4. As a football flies through the air, it spins or rotates. Estimate the angle of rotation shown below.



[4] ____________________________

5. Plot a number of points in the first quadrant and determine their coordinates after rotations of $90°$, $180°$, and $270°$ about the origin. Make a conjecture about the coordinates of a point (x, y) after each such rotation.

[5] ____________________________

6. A figure has rotational symmetry if there is at least one other position in which it is identical to itself after being rotated around its center point. Describe one such figure and tell the angles of rotation for which it has rotational symmetry.

[6] ____________________________

7. Compare the quantity in Column A with the quantity in Column B.

Column A	Column B
the angle of rotation about O, the center of pentagon $ABCDE$, that maps A to B	the angle of rotation about O, the center of hexagon $ABCDEF$, that maps A to B

[A] The quantity in Column A is greater.
[B] The quantity in Column B is greater.
[C] The quantities are equal.
[D] The relationship cannot be determined on the basis of the information supplied.

[7] ______

[1] $A'(0, 4)$, $B'(-4, 2)$, $C'(-5, 4)$, $D'(-1, 6)$

[2] D

[3] D

[4] Answers may vary; about $90°$ clockwise

[5] after $90°$: the new coordinates are $(-y, x)$; after $180°$: $(-x, -y)$; after $270°$: $(y, -x)$

[6] For example, an equilateral triangle has rotational symmetry for rotations of $120°$ and $240°$.

[7] A