Geometry
Worksheet 13.7-Rotations

Name_____
Date_____ **Period**_____

1. The transformation f(x,y) = (y,-x) is what degree rotation? 270°

Use the rotation described by f(x,y) = (y,-x). Find the image of the following points:

2. (4,5) (5,-4)	3. (1,0) (0,-1)	4. (2,3) (3,-2)	5. (6,5) (5,-6)

6. The transformation f(x,y) = (-y,x) is what degree rotation? 90°
7. The transformation f(x,y) = (-x,-y) is what degree rotation? 180°
8. Are there any fixed points under a rotation? If so, what are they? Yes, center of rotation at the origin (0,0).

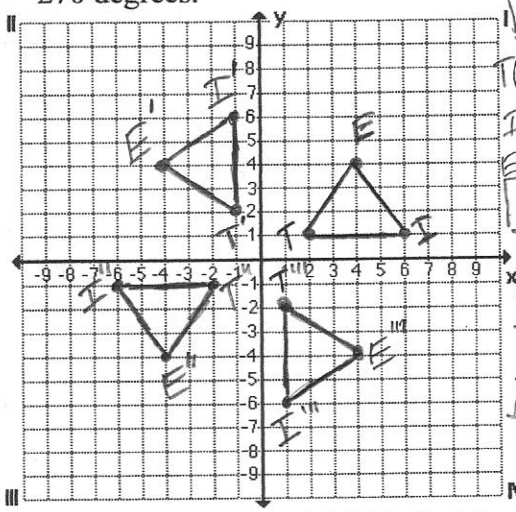
Describe in functional notation the rotation that maps the first point onto its image. What degree rotation are they?

9. (7,4) → (-7,-4) f(x,y)=(-x,-y) 180°	10. (3,2) → (-2,3) f(x,y)=(-y,x) 90°	11. (0,2) → (0,-2) f(x,y)=(-x,-y) 180°	12. (5,6) → (6,-5) f(x,y)=(y,-x)

Given the image point P(-2,5). What would the preimage be before a rotation of:

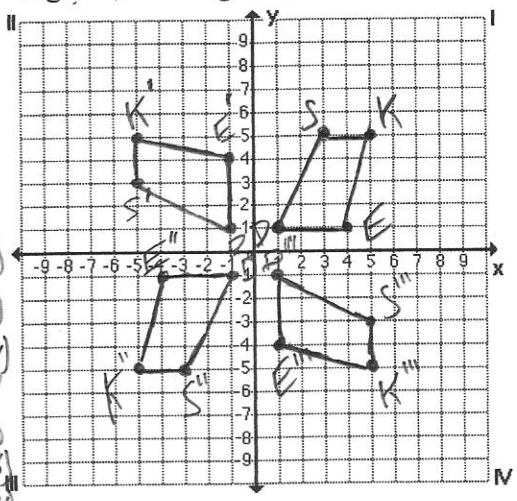
13. 180° (2,-5)	14. 90° (5,2)	15. 270° (-5,2)

16. Graph the triangle created by points T(2,1); I(6,1), and E(4,4). Graph its image after rotating it 90 degrees; 180 degrees; 270 degrees.



90° (-y,x)
T(2,1) → (-1,2)
I(6,1) → (-1,6)
E(4,4) → (-4,4)
180° (-x,-y)
T(2,1) → (-2,-1)
I(6,1) → (-6,-1)
E(4,4) → (-4,-4)
270° (y,-x)
T(2,1) → (1,-2)
I(6,1) → (1,-6)
E(4,4) → (4,-4)

17. Graph the ~~parallelogram~~ quadrilateral created by points D(1,1); E(4,1); S(3,5); and K(5,5). Graph its image after rotating it 90 degrees; 180 degrees; 270 degrees.



18. Given points A(2,1) and B(6,9) find the following:

	Original Points	90° rotation	180° rotation	270° rotation
	A(2 , 1) B(6 , 9)	A′(−1 , 2) B′(−9 , 6)	A′(−2 , −1) B′(−6 , −9)	A′(1 , −2) B′(9 , −6)
Find the slope of the segment	2	$-\frac{1}{2}$	2	$-\frac{1}{2}$
How does the slope compare to slope of the original segment?	Not applicable	negative (opposite) reciprocal $\perp$	Same $\parallel$	negative (opposite) reciprocal $\perp$
Find the equation of the line containing the segment	$y-y_1=m(x-x_1)$ $y-1=2(x-2)$ $y-1=2x-4$ $\boxed{y=2x-3}$	$y-y_1=m(x-x_1)$ $y-2=-\frac{1}{2}(x+1)$ $y-2=-\frac{1}{2}x-\frac{1}{2}$ $\boxed{y=-\frac{1}{2}x+\frac{3}{2}}$	$y-y_1=m(x-x_1)$ $y+1=2(x+2)$ $y+1=2x+4$ $\boxed{y=2x+3}$	$y-y_1=m(x-x_1)$ $y+2=-\frac{1}{2}(x-1)$ $y+2=-\frac{1}{2}x+\frac{1}{2}$ $\boxed{y=-\frac{1}{2}x-\frac{3}{2}}$

Are any of the equations the same? If so, which ones? NO

Are any of the lines parallel? If so, which ones? Yes; original and 180° rotation
90° and 270° rotation

Are any of the lines perpendicular? If so, which ones? Original $\perp$ 90°; original $\perp$ 270°
90° $\perp$ 180°; 180° $\perp$ 270°

Distance Formula: $D=\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$

Find the length of each segment	$\sqrt{(6-2)^2+(9-1)^2}$ $\sqrt{16+64}$ $\sqrt{80}=\boxed{4\sqrt{5}}$	$4\sqrt{5}$	$4\sqrt{5}$	$4\sqrt{5}$
Find the midpoint of each segment	(4, 5)	(−5, 4)	(−4, −5)	(5, −4)