

TRANSFORMATION		OPERATION	REPRESENTATION	ISOMETRY?	
Translation (T)		addition, subtraction	$(x, y) \rightarrow (x + a, y - b)$	Yes, direct	
Dilation (D)		multiplication, division	$(x, y) \rightarrow (ax, \frac{y}{b})$	No	
Reflection (r)	x-axis	opposite	$(x, y) \rightarrow (x, -y)$	Yes, opposite	
	y-axis	opposite	$(x, y) \rightarrow (-x, y)$	Yes, opposite	
	y=x	switch	$(x, y) \rightarrow (y, x)$	Yes, opposite	
	point (origin)	opposite	$(x, y) \rightarrow (-x, -y)$	Yes, direct	
Rotation (R)	CCW	CW			
	90°	270°	opposite, switch	$(x, y) \rightarrow (-y, x)$	Yes, direct
	180°	180°	opposite	$(x, y) \rightarrow (-x, -y)$	Yes, direct
	270°	90°	opposite, switch	$(x, y) \rightarrow (y, -x)$	Yes, direct