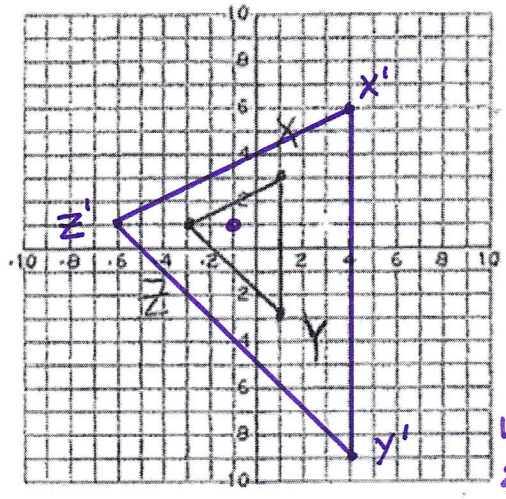
Name Pettier Period _____ Date _____

Rotations And Dilations From Points Other Than The Origin

1. Graph the dilated image of Triangle XYZ using a scale factor of 5/2 and a center of dilation (-1, 1).



X' (4,6)
Y' (4,-9)
Z' (-6,1)

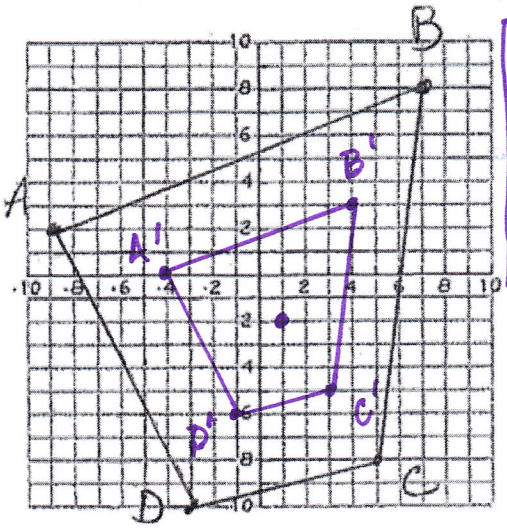
Multiply distances from the Point of Dilation by 5/2.

Point X: 2→ 2↑ ⇒ 5→ 5↑
Point Y: 2→ 4↓ ⇒ 5→ 10↓
Point Z: 2← ⇒ 5←

Using Rules: 1) Translate Point of Dilation to Origin, 2) Dilate, 3) Translate Point of Dilation back.

	X(1,3)	Y(4,-3)	Z(-3,1)
1) (x,y) → (x+1, y-1)	(2,2)	(2,-4)	(-2,0)
2) (x,y) → (5/2x, 5/2y)	(5,5)	(5,-10)	(-5,0)
3) (x,y) → (x-1, y+1)	(4,6)	(4,-9)	(-6,1)

2. Graph the dilated image of Quadrilateral ABCD using a scale factor of ½ and center of dilation (1, -2).



A' (-4,0)
B' (4,3)
C' (3,-5)
D' (-1,-6)

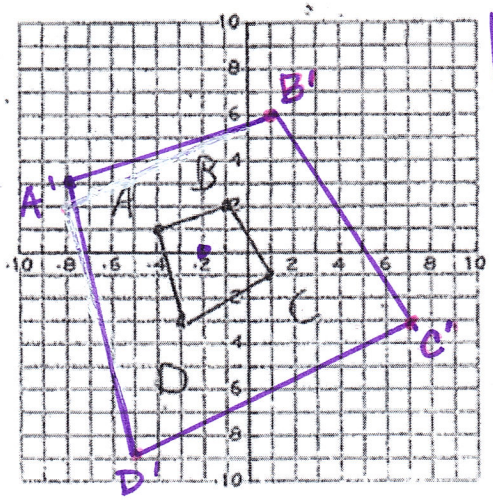
Multiply distances from center of dilation by 1/2

Point A: 10← 2↑ ⇒ 5← 1↑
Point B: 8→ 10↑ ⇒ 4→ 5↑
Point C: 4→ 6↓ ⇒ 2→ 3↓
Point D: 4← 8↓ ⇒ 2← 4↓

Using Rules:

	A(-9,2)	B(7,8)	C(5,-8)	D(-3,-10)
1) (x,y) → (x-1, y+2)	(-10,4)	(6,10)	(4,-6)	(-4,-8)
2) (x,y) → (½x, ½y)	(-5,2)	(3,5)	(2,-3)	(-2,-4)
3) (x,y) → (x+1, y-2)	(-4,0)	(4,3)	(3,-5)	(-1,-6)

3. Graph the dilated image of Quadrilateral ABCD using a scale factor of 3 and center of dilation (-2, 0).



A' (-8,3)
B' (1,6)
C' (7,-3)
D' (-5,9)

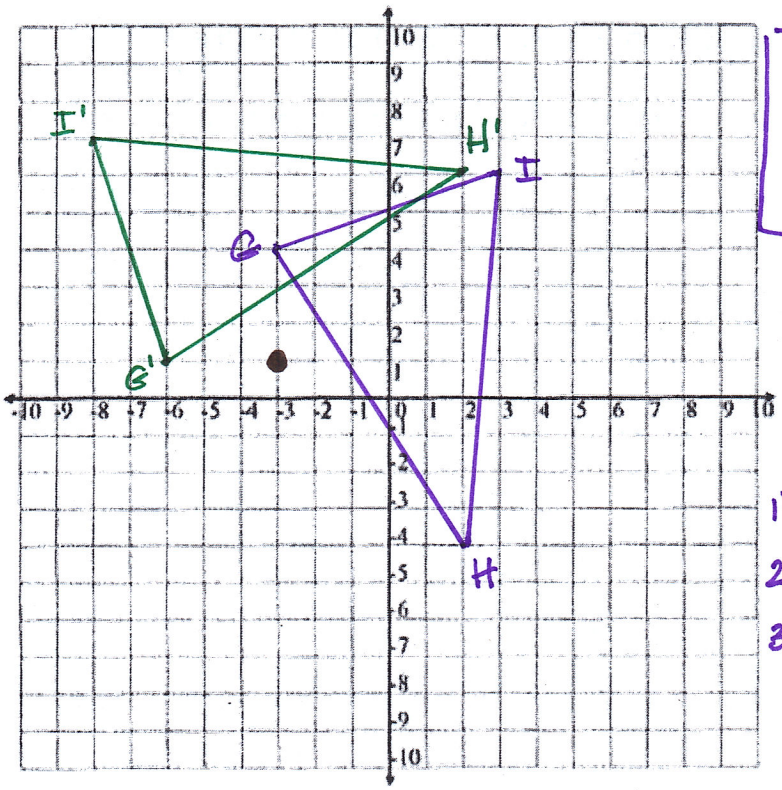
Multiply distance from COD by 3:

Point A: 2← 1↑ ⇒ 6← 3↑
Point B: 1→ 2↑ ⇒ 3→ 6↑
Point C: 3→ 1↓ → 9→ 3↓
Point D: 1← 3↓ → 3← 9↓

Using Rules:

	A(-4,1)	B(-1,2)	C(1,-1)	D(-3,-3)
1) (x,y) → (x+2, y)	(-2,1)	(1,2)	(3,-1)	(-1,-3)
2) (x,y) → (3x, 3y)	(-6,3)	(3,6)	(9,-3)	(-3,-9)
3) (x,y) → (x-2, y)	(-8,3)	(1,6)	(7,-3)	(-5,-9)

4. Rotate Triangle GHI with G(-3, 4), H(2, -4) and I(3, 6) 270° clockwise about the point (-3, 1).



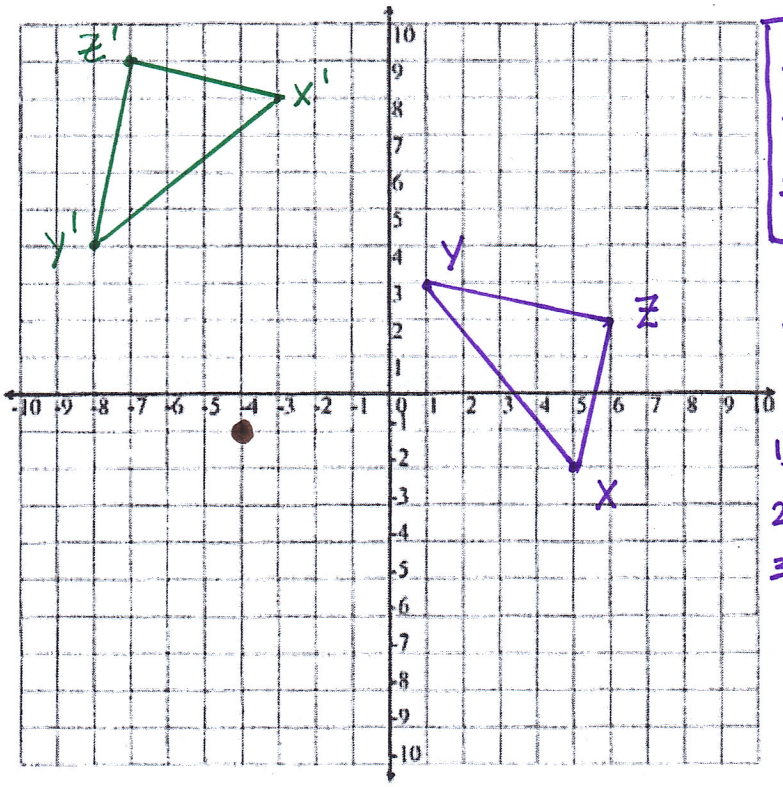
G' (-6,1)
H' (2,6)
I' (-8,7)

You can find the image by imagining that the point of rotation is the origin and then use the paper rotation method.

Using Rules: 1) Translate the center of rotation to the origin, 2) Rotate, 3) Translate back.

	G(-3,4)	H(2,-4)	I(3,6)
1) $(x,y) \to (x+3, y-1)$	(0,3)	(5,-5)	(6,5)
2) $(x,y) \to (-y,x)$	(-3,0)	(5,5)	(-5,6)
3) $(x,y) \to (x-3, y+1)$	(-6,1)	(2,6)	(-8,7)

5. Rotate Triangle XYZ with X(5, -2), Y(1, 3) and Z(6, 2) 90° counter clockwise about the point (-4, -1).



X' (-3,8)
Y' (-8,4)
Z' (-7,9)

Using Rules:

	X(5,-2)	Y(1,3)	Z(6,2)
1) $(x,y) \to (x+4, y+1)$	(9,-1)	(5,4)	(10,3)
2) $(x,y) \to (-y,x)$	(1,9)	(-4,5)	(-3,10)
3) $(x,y) \to (x-4, y-1)$	(-3,8)	(-8,4)	(-7,9)