

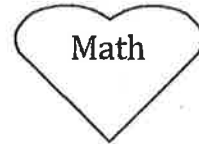
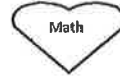
Geometry Notes

Dilations

Name: _____

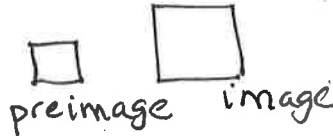
Date: _____

***Dilation:** a transformation that produces an image that is the same Shape as the original, but a different Size



***Scale Factor (r):** a number that multiplies by the coordinates to produce one of the following....

1. Enlargement $r > 1$



2. Reduction $r < 1$



3. Congruence Transformation $r = 1$



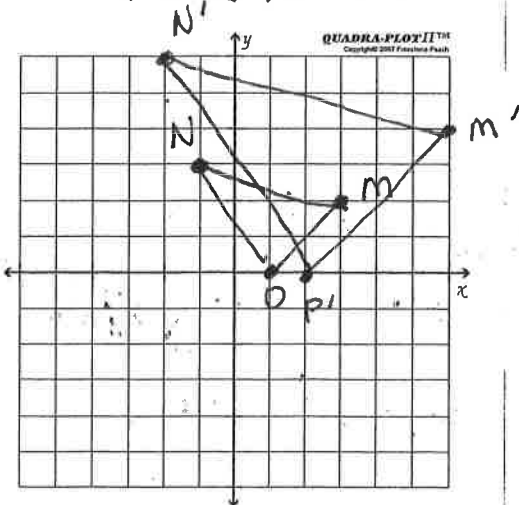
Ex1: Graph the pre-image and image of the polygon with the given coordinates. Determine whether the dilation is an enlargement, reduction, or congruence transformation.

A) Scale Factor: 2

M(3, 2) N(-1, 3) P(1, 0)

$(x, y) \rightarrow (2x, 2y)$

M' (6, 4) N' (-2, 6) P' (2, 0)

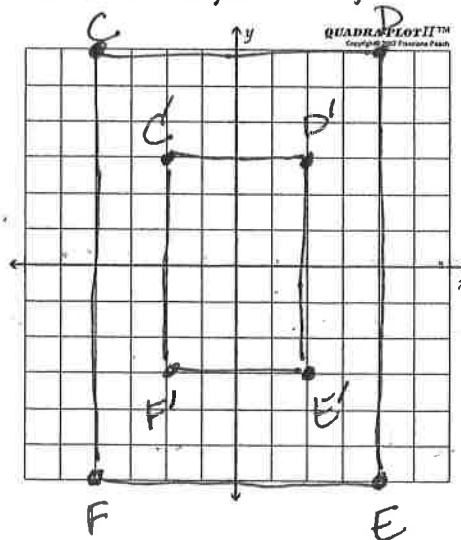


B) Scale Factor: $\frac{1}{2}$

C(-4, 6) D(4, 6) E(4, -6) F(-4, -6)

$(x, y) \rightarrow (\frac{1}{2}x, \frac{1}{2}y)$

C' (-2, 3) D' (2, 3) E' (2, -3) F' (-2, -3)



Ex2: Determine the scale factor for each dilation. Determine whether the dilation is an enlargement, reduction, or congruence transformation.

***Scale Factor =** $\frac{\text{Image Length}}{\text{Pre-image Length}}$ OR $\frac{\text{New length}}{\text{Original length}}$

A) *New*
 CGHJ is a dilation image of CDEF.

 $\frac{8}{4} = 2$
 $r = 2$
 enlargement

B) *New*
 ΔCPQ is a dilation image of ΔCYZ .

 $C(0,0)$ $Y(-3,3)$ $Z(-4,1)$
 $C(0,0)$ $P(-1,1)$ $Q(-2,1)$
 $r = \frac{1}{3}$ reduction

C) STUVWX is a dilation image of MNOPQR.

 reduction $\frac{1}{2}$
 $M(3,3)$ $N(3,3)$
 $S(-1.5, 1.5)$ $(1.5, 1.5)$

D) ΔHJK is a dilation image of ΔHJK .

 All the same
 $r = 1$
 Congruence

E) Pre-image $K(-3, 10)$

Image $K'(-12, 40)$

$r = 4$
 enlargement

F) Pre-image $Z(15, 6)$

Image $Z'(5, 2)$

$\frac{1}{3}$ reduction

Find measure of the dilation image $\overline{A'B'}$ or of preimage \overline{AB} using the scale factor given. $(r)(AB) = \overline{A'B'}$

G) $AB = 4$ $r = 2$
 $2(4) = \overline{A'B'}$
 $8 = \overline{A'B'}$

H) $\overline{A'B'} = 8$ $r = 4$
 $4(AB) = 8$
 $AB = 2$