**3.3**

**Name (print first and last)** _____ **Per**_____ **Date:** 10/8 due 10/9

**3.3 Rigid Transformations: Invariance** **Geometry Regents 2013-2014 Ms. Lomac**

SLO: I can verbally and visually communicate the qualities of rigid transformations.

(1) ☐ Write 2 sentences that use forms of the word vary. Possible word forms are vary, variance, variable, varies, variety.

_____

_____

_____

_____

☐ DEFINE INVARIANT IN YOUR NOTES.

(2) ☐ The basic rigid transformations are _____ (flip), _____ (turn), and _____(slide).

(3) ☐ On the back of this page are 3 figures, (a), (b), and (c).

☐ Reflect the original figure in part (a)

☐ Compare your figure and reflection to the teacher's. Are they the same? _____. Why/why not?_____

_____

☐ What information must be provided to guarantee that the a specific reflection is performed?

_____

_____

☐ Rotate the original figure in part (b)

☐ Compare your figure and rotation to the teacher's. Are they the same? _____. Why/why not?_____

_____

☐ What information must be provided to guarantee that a specific rotation is performed?

_____

_____

☐ Translate the original figure in part (c)

☐ Compare your figure and translation to the teacher's. Are they the same? _____. Why/why not?_____

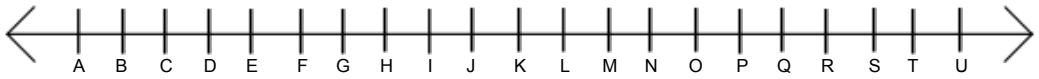
_____

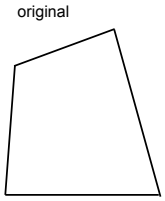
☐ What information must be provided to guarantee that a specific translation is performed?

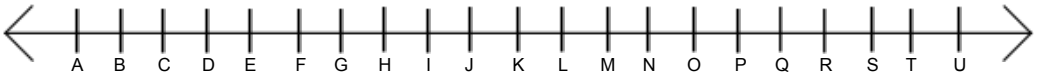
_____

_____

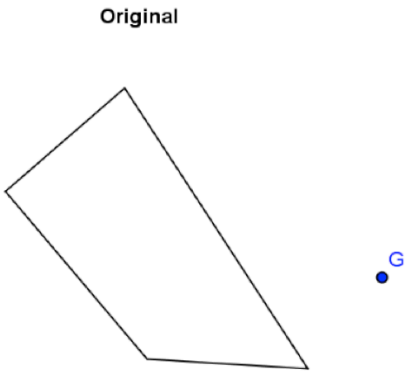
(a)


A B C D E F G H I J K L M N O P Q R S T U

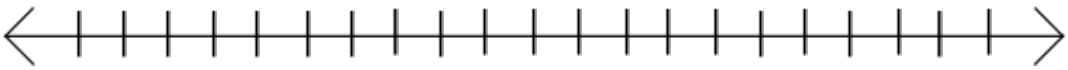

original

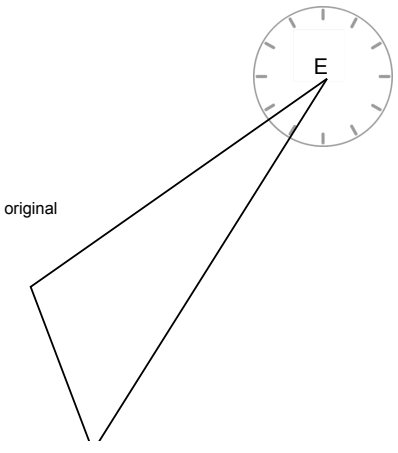

A B C D E F G H I J K L M N O P Q R S T U

(b)


Original
G

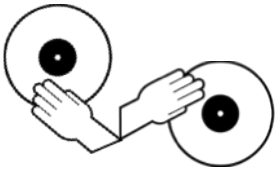
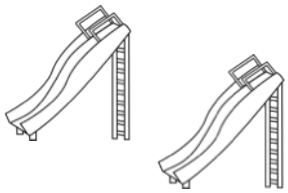
(c)




E
original

(4) Vocabulary & Geometry Assumptions

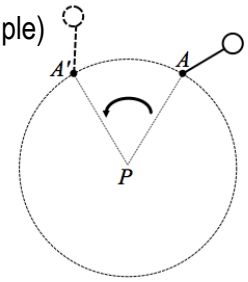
**basic rigid motion** **invariance** **map(s) to** **reflection** **rotation** **translation**

| Concept/Term | Notes |
|---|---|
| **Rigid Motion (Transformation)** | A transformation of the plane is a function that assigns to each point of the plane a unique point in the plane. Transformations that preserve lengths of segments and measures of angles are called _____ . A dilation is an example of a transformation that preserves _____ measures but not the lengths of segments. In this lesson, we will work only with rigid transformations. We call a figure that is about to undergo a transformation the _____ while the figure that has undergone the transformation is called the _____. |
| **Reflection** |  _____ are **invariant transformation functions** of the plane such that:<br>(a) Any point P on the line of the reflection maps to itself (P' = P)<br>(b) Any point P not on the line of reflection maps to Q such that the line of reflection is the _____ _____ of PQ.<br>Notation: $r_{x\text{-axis}}$ means reflect across the x-axis. |
| **Rotation** |  _____ are **invariant transformation functions** of the plane around a center point C such that:<br>(a) The center of rotation, point C, maps to itself (C' = C)<br>(b) Any point P not on the center of rotation maps to a point Q on circle C with radius CP such that m∠PCQ is equal to the degree of the rotation. {which includes direction --clockwise (negative) or counterclockwise (positive)} Notation: $R_{90°}$ means rotate 90° clockwise around the origin on a coordinate grid. |
| **Translation** |  _____ *are **invariant** transformation functions* of the plane along a path with distance and direction such that any point (x,y) on the plane maps to (x + a, y + b) where (a,b) describes the path of translation.. $T_{(3,-1)}$ means translate a figure right 3 units and down 1 unit. |

**3.3 HW**
**Name (print first and last)** _____ **Per**_____ **Date:** 10/8 due 10/9
**3.3 Rigid Transformations: Functions & Invariance** **Geometry Regents 2013-2014 Ms. Lomac**

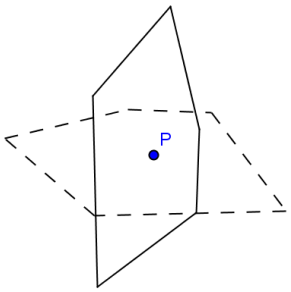
(1) For each rotation below, identify the preimage, image, center of rotation, direction of rotation, and approximate the number of degrees of rotation.

(Example)



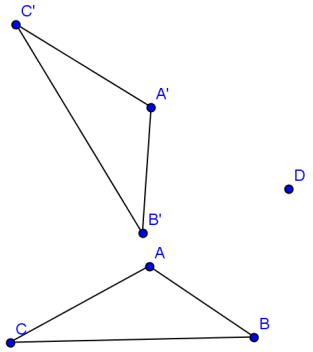

preimage: A and solid line
image: A' and dashed line
center of rotation: point P
direction: positive (counterclockwise)
degree of rotation: approximately 60°

(a)




preimage: _____
image: _____
center of rotation: _____
direction: _____
degree of rotation: _____

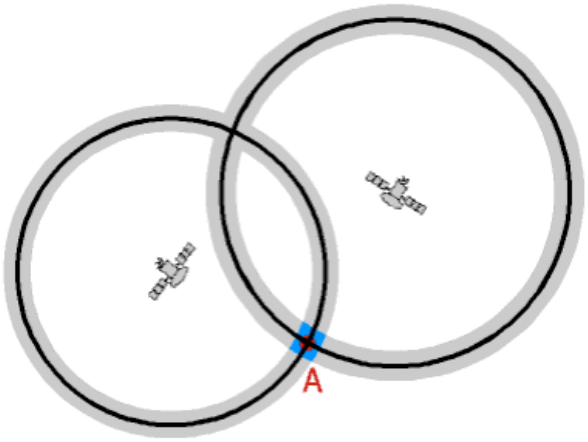
(b)




preimage:_____
image:_____
center of rotation:_____
direction: _____
degree of rotation:_____

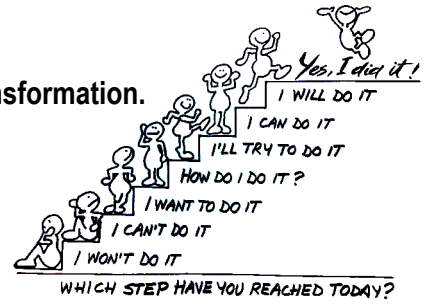
(2) The diagram below is an illustration from a website that explains how GPS (Global Positioning Systems) work. The distance between you (point A) and each satellite is measured. Can the distances measured from 2 satellites pinpoint your exact location? Justify your claim with the work that we have done so far. You may draw on the diagram if it helps you justify your claim.

_____
_____
_____
_____
_____
_____
_____
_____




_____
_____
_____
_____
_____

3.3 Exit Ticket Name_____Per_____




**For each set of directions, describe what information is missing to complete the transformation.**

**(a) Reflect triangle ABC.**

_____

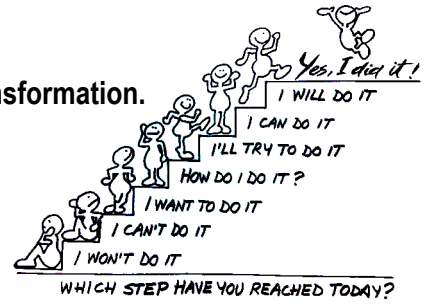
**(b) Rotate segment PQ 30° clockwise.**

_____

**(c) Translate point M 5 units**

_____

3.3 Exit Ticket Name_____Per_____

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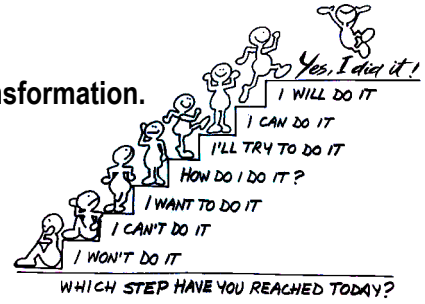


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_____

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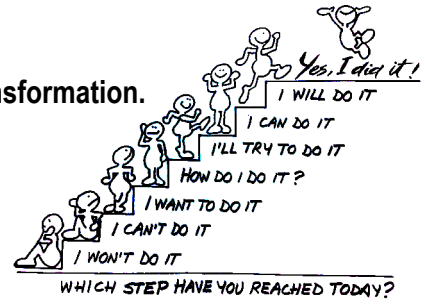


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_____