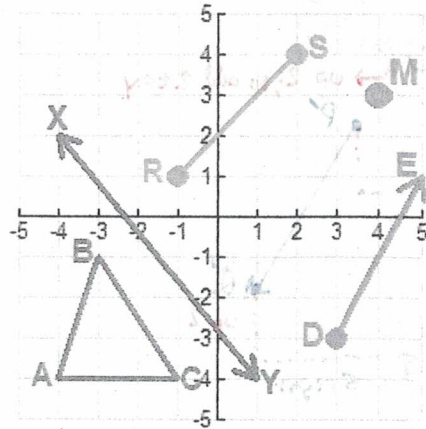


Unit # 4 – Geometric Transformations: Translations

Some Basic Symbols for Geometric Figures

Figure Name	Symbolization
1.) <u>Point</u>	(CAPITAL LETTER) • M
2.) <u>Line</u>	\longleftrightarrow XY
3.) <u>Segment</u>	\overline{RS}
4.) <u>Ray</u>	\overrightarrow{DE}
5.) <u>Triangle</u>	$\triangle ABC$



– **geometric transformation** → a mapping that results in a change of geometric figure's Position, Shape, or Size

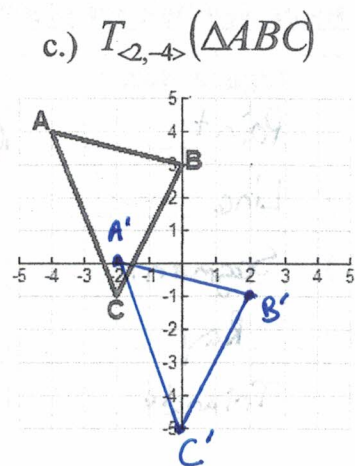
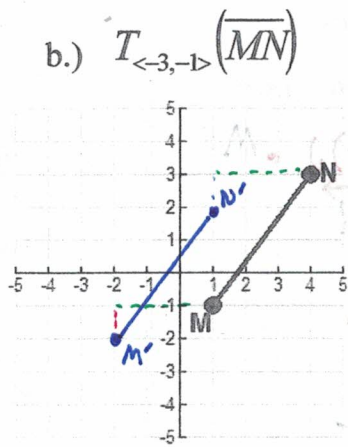
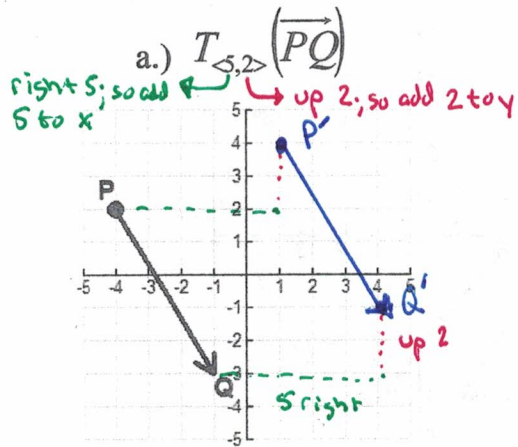
• There are 3 types of geometric transformations:

1.) <u>Translations (Slide)</u>	2.) <u>Reflections (Flip)</u>	3.) <u>Rotation (Turn)</u>
<p>Notice:</p> <ul style="list-style-type: none"> -no rotation -no flipping -no change in size <p>Visually known as <u>sliding</u></p>	<p>Notice:</p> <ul style="list-style-type: none"> -no change in size -no rotation -no slide <p>Visually known as <u>flipping</u></p>	<p>Notice:</p> <ul style="list-style-type: none"> -Rotates about specific point. -no slide -no change in size -no reflection <p>Visually known as <u>turning</u></p>

- **preimage** – the name of the **ORIGINAL** figure **BEFORE** a geometric transformation
 - **image** – the name of the **RESULTING** figure **AFTER** a geometric transformation labeled with primes (')
 - **rigid motion** – a transformation that preserves (keeps original) distance and angle measures
 - **translation notations** (what we are going to focus on today) –
 - In algebraic functions, we use words (left 4, up 5, right 3, down 1, etc.)
 - In geometric figures, we use **<VECTORS>** that looks like <a, b> where
 - the first number of the vector = left (-) or right (+) translations which affect the x-values and
 - the second number of the vector = down (-) or up (+) translations which affect the y-values
 A **capital letter T** is put before the vector so that it specifically represents a translation.
- For Example: $T_{\langle 2, -3 \rangle}$ means Translates figure 2 right and 3 down { add 2 to x's, subtract 3 from y's }
- $T_{\langle -4, 5 \rangle}$ means Translates figure 4 left and 5 up
- **performing geometric translations** – can be done graphically (w/pictures) or algebraically (w/tables)

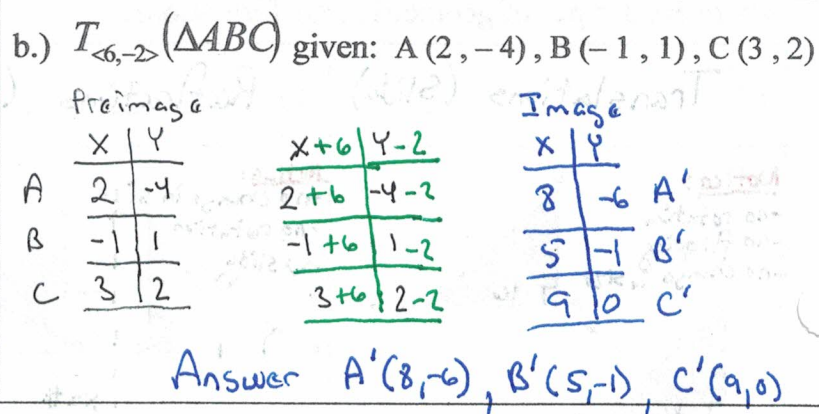
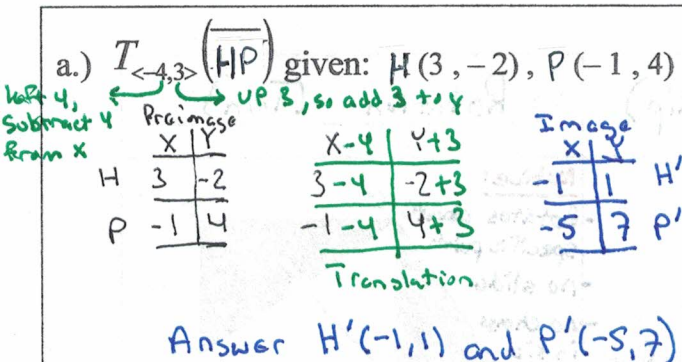
Performing Geometric Translations – Graphically

Example 1: Perform the given geometric translation on each geometric figure below.



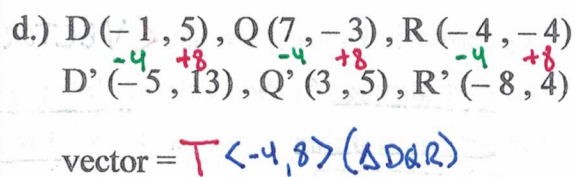
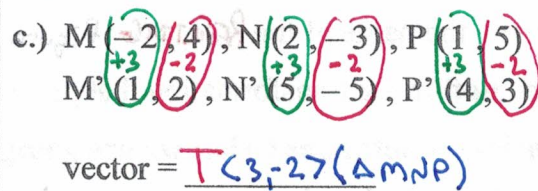
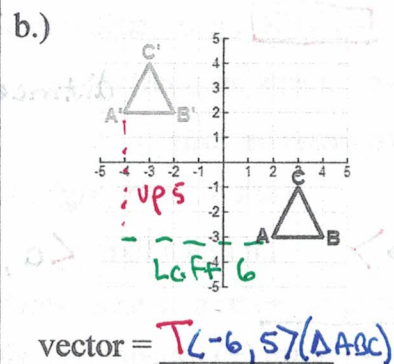
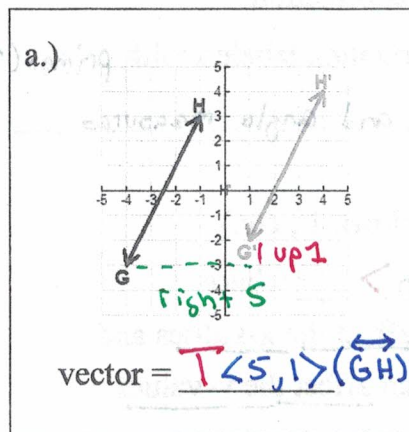
Performing Geometric Translations – Algebraically

Example 2: Perform the given geometric translation algebraically using tables.



Performing Geometric Translations – Working Backwards

Example 3: Determine the vector that describes the given translation.



* Always go from PREIMAGE (no primes) to Image (primes) *