

**Week 23: 2/1-2/5 Math I**

**Due: 2/8**

**Objectives:**

1. To learn what a dilation is.
2. To apply dilations to figures.
3. To learn about regular and semi-regular tessellations.
4. To assess knowledge of transformations.

**Monday:**

**In Class:**

**Notes in composition book: Dilations, tessellations and semi-regular tessellations.**

**Get ready for Shadow Day tomorrow**

**Homework:**

**Complete Dilations Handout attached**

**Tuesday:**

**In Class:**

**8<sup>th</sup> grade Shadow Day: "Who is Optimus Composite?" activity.**

**Homework:**

**Finish "Optimus Composite" activity if you did not complete it during class.**

**Wednesday:**

**Study for Chapter 8 Quiz. Since this chapter was so short, we will only be having a quiz and not a test. You may use one sheet, one sided as a cheat sheet.**

**Thursday:**

**In Class:**

**Chapter 8 Quiz**

**Homework:**

**None**

**Friday:**

**Complete "Get Ready for Chapter 10" on page 589 of text.**

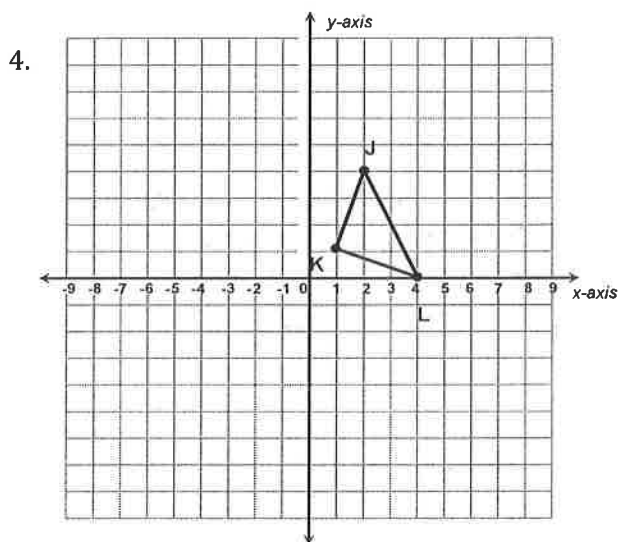
Monday Feb

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Dilations/Translations Worksheet

**Directions:** Answer the following questions to the best of your ability. For the y-axis, use the same scaling as the x-axis

1. In Math, the word dilate means to \_\_\_\_\_ or \_\_\_\_\_ a figure.
2. If a scale factor is less than 1, then your figure gets \_\_\_\_\_.
3. If a scale factor is greater than 1, then your figure gets \_\_\_\_\_.

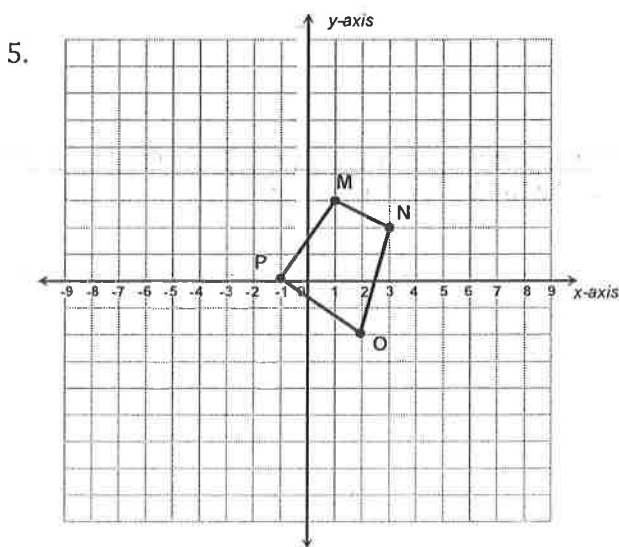


Graph the dilated image of triangle JKL using a scale factor of 2 and (0,0) as the center of dilation.

J: \_\_\_\_\_ J': \_\_\_\_\_

K: \_\_\_\_\_ K': \_\_\_\_\_

L: \_\_\_\_\_ L': \_\_\_\_\_



Graph the dilated image of quadrilateral MNOP using a scale factor of 3 and the origin as the center of dilation.

M: \_\_\_\_\_ M': \_\_\_\_\_

N: \_\_\_\_\_ N': \_\_\_\_\_

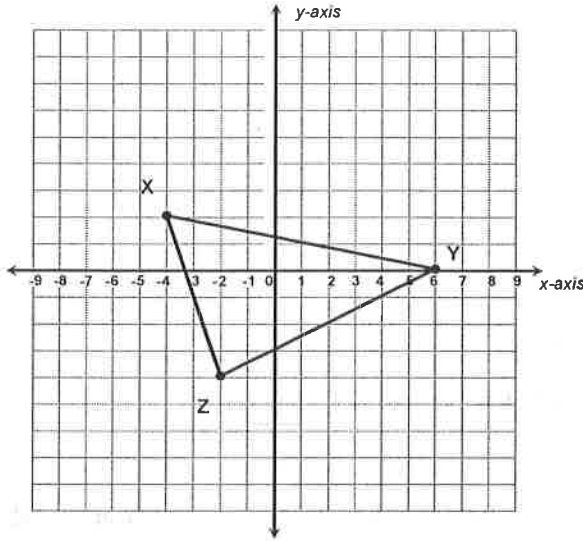
O: \_\_\_\_\_ O': \_\_\_\_\_

P: \_\_\_\_\_ P': \_\_\_\_\_

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Name: \_\_\_\_\_ Date: \_\_\_\_\_

6.



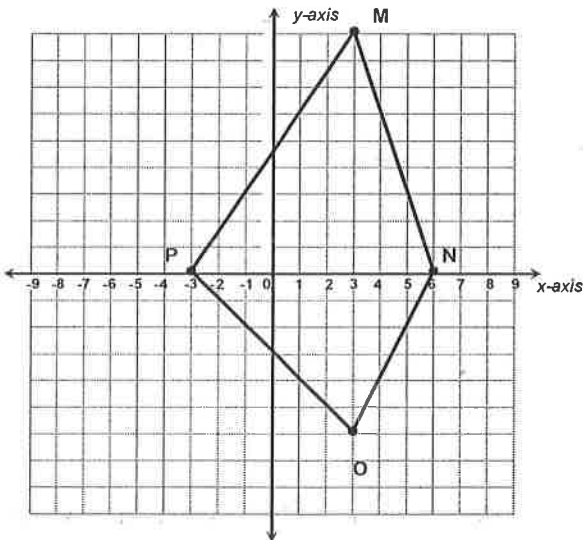
Graph the dilated image of triangle XYZ using a scale factor of 1.5 and (0,0) as the center of dilation.

X: \_\_\_\_\_ X': \_\_\_\_\_

Y: \_\_\_\_\_ Y': \_\_\_\_\_

Z: \_\_\_\_\_ Z': \_\_\_\_\_

7.



Graph the dilated image of quadrilateral MNOP using a scale factor of  $\frac{1}{3}$  and the origin as the center of dilation.

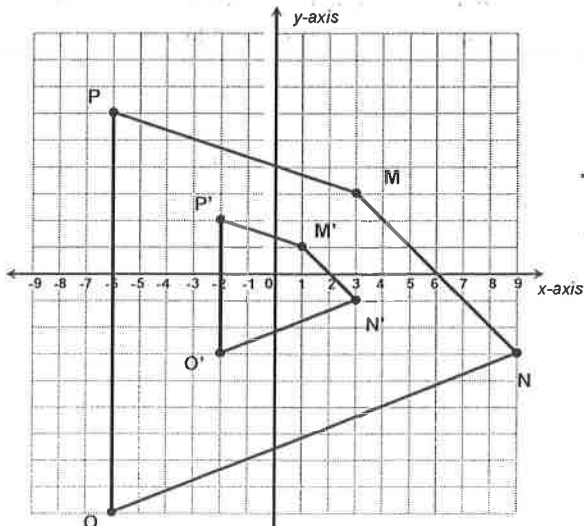
M: \_\_\_\_\_ M': \_\_\_\_\_

N: \_\_\_\_\_ N': \_\_\_\_\_

O: \_\_\_\_\_ O': \_\_\_\_\_

P: \_\_\_\_\_ P': \_\_\_\_\_

8.



Describe the dilation of quadrilateral MNOP, using the origin as the center.

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Monday HW

Name: \_\_\_\_\_ Date: \_\_\_\_\_

9. The table below shows the coordinates of triangle RST and the coordinates of  $R'$  in triangle  $R'S'T'$ . Triangle  $R'S'T'$  is a dilation of triangle RST.

| Triangle RST |            | Triangle $R'S'T'$ |            |
|--------------|------------|-------------------|------------|
| R            | $(-2, -3)$ | $R'$              | $(-6, -9)$ |
| S            | $(0, 2)$   | $S'$              |            |
| T            | $(2, -3)$  | $T'$              |            |

**Part A**

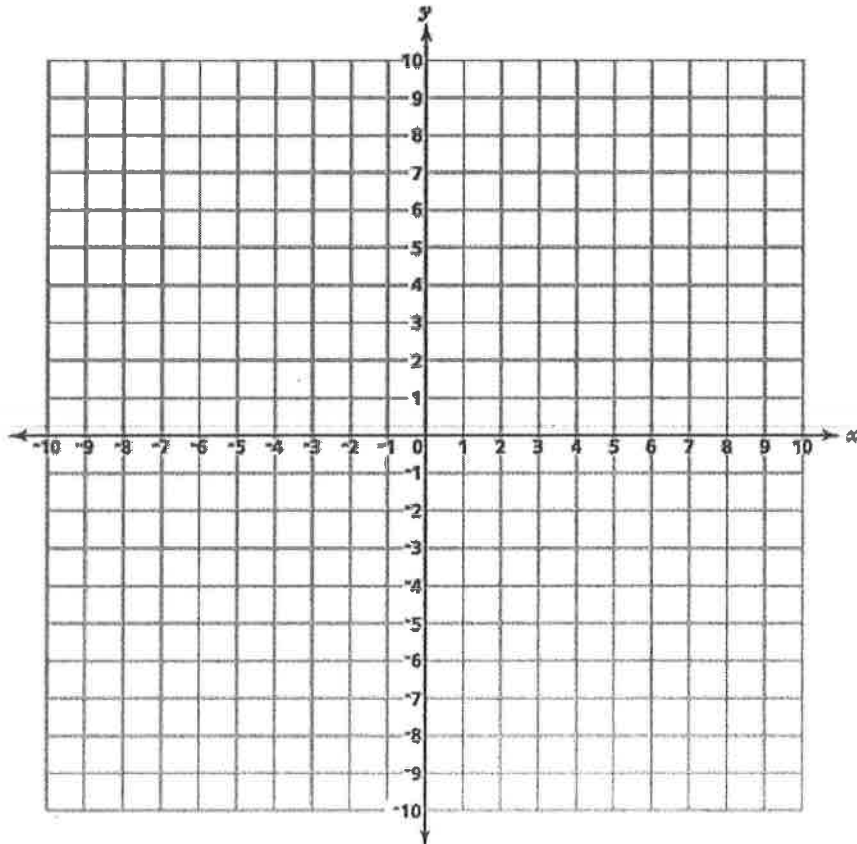
What are the coordinates of point  $S'$  and point  $T'$ ?

Answer  $S' = (\underline{\hspace{1cm}}, \underline{\hspace{1cm}})$

$T' = (\underline{\hspace{1cm}}, \underline{\hspace{1cm}})$


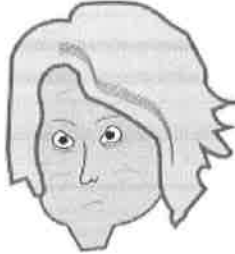




**Part B**

On the grid below, draw triangle RST and triangle  $R'S'T'$ .



# Who is Optimus Composite?



|  |   |
|--|---|
| <p>Name: Freddy<br/>Occupation: Shift Supervisor<br/>Favorite Number: 1000</p>  | <p>Name: Linda<br/>Occupation: Retired<br/>Favorite Number: 1</p>                |
| <p>Name: Shaquille<br/>Occupation: Engineer<br/>Favorite Number: 2013</p>      | <p>Name: Guadalupe<br/>Occupation: Lawyer<br/>Favorite Number: 911</p>          |
| <p>Name: Luigi<br/>Occupation: Restaurant Owner<br/>Favorite Number: 100</p>  | <p>Name: Pat<br/>Occupation: DMV Representative<br/>Favorite Number: 1111</p>  |

Scene #1 El Dorado Café -- Caracas, Venezuela



Optimus Composite snuck into a Venezuelan coffee shop dedicated to the legendary lost city of gold, El Dorado. It appears that Optimus stole what the owner believes is a treasure map.

Hola! Optimus Composite is ready to transform Latin America! I found this great map. Follow the steps to find the lost El Dorado Gold!

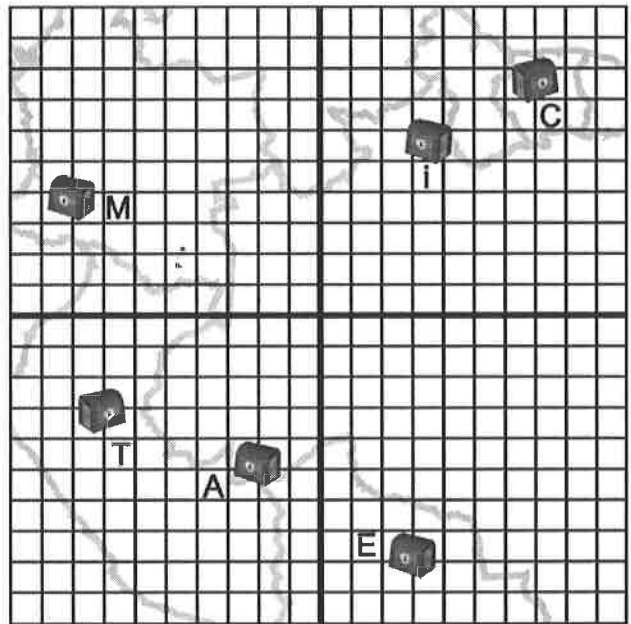
**Step 1:**  $\triangle ABC$  has vertices  $A(-5, 3)$   $B(0, 7)$   $C(1, -1)$

**Step 2:** Reflect  $\triangle ABC$  over the y-axis to make  $\triangle A'B'C'$

**Step 3:** Translate  $\triangle A'B'C'$  up 2 units and to the left 6 units to make  $\triangle A''B''C''$

**Step 4:** Reflect  $\triangle A''B''C''$  over the x-axis and inside the triangle you will find the correct chest.

This letter will be equal to the number 79.

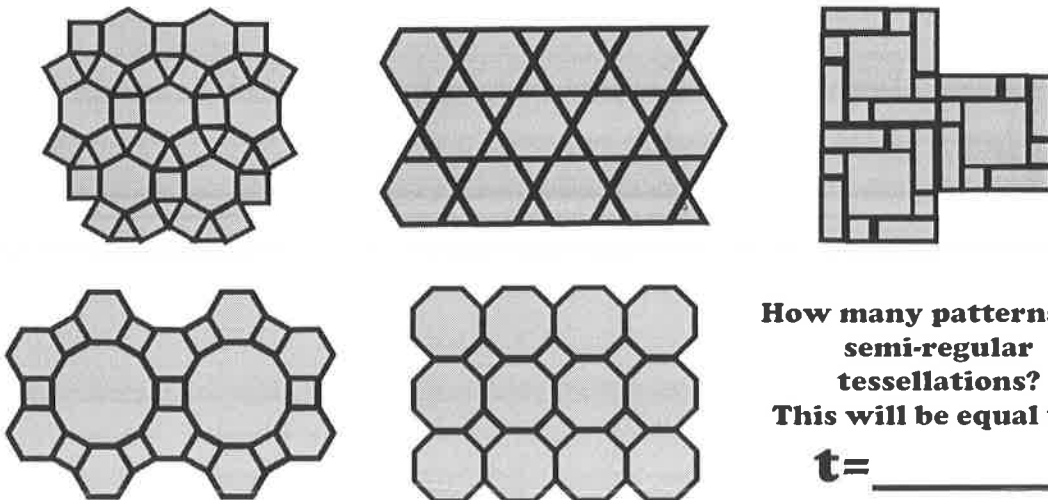


\_\_\_\_\_ = 79

Scene #2 Ecuador Tile Manufacturer -- Quito, Ecuador

After the robbery at the café, Optimus took a taxi to Ecuador, broke into a warehouse and stole super-sized geometric stone tiles. It is unclear how the tile will be used for the world conquering device.

When I'm done with all these thefts, I'm going to refinishing my bathroom floor! My significant other is a little picky and I can only use a pattern that is a semi regular tessellation! **How many of these patterns could I use?**



**How many patterns are semi-regular tessellations?**

**This will be equal to  $T$**

**$t =$  \_\_\_\_\_**



An entire square mile of ground was somehow excavated from earth. It's believed this ground had one of the famed Nazca Lines on it. Optimus Composite carved this note into the leftover dirt.

Carved into the desert are a number of drawings that can only be seen from a helicopter. See if you can see my dilation inspired drawings of the drawings! Fill in the missing four pieces (either the scale factor,  $\overline{AB}$  or  $\overline{A'B'}$ ) with correct values from the "Number Bank".

|  |  |
|--|--|
| <h3 style="text-align: center;">The Hummingbird</h3> <p style="text-align: center;"><math>r = 4.5</math></p> | <h3 style="text-align: center;">The Monkey</h3> <p style="text-align: center;"><math>r = \underline{\hspace{2cm}}</math></p> |
|--|--|

|  |   |
|--|---|
| <h3 style="text-align: center;">The "Trapezoid" <small>(even though it's not)</small></h3> <p style="text-align: center;"><math>r = 2/3</math></p> | <h3 style="text-align: center;">The Whale</h3> <p style="text-align: center;"><math>r = \underline{\hspace{2cm}}</math></p> |
|--|---|

| Number Bank  |               |               |
|--------------|---------------|---------------|
| <b>130</b>   | $\frac{3}{4}$ | $\frac{1}{2}$ |
| <b>89.25</b> | <b>3.5</b>    | <b>110</b>    |

What is leftover in the Number Bank?  
 (Add these together. The sum will equal  $m$ )

**$m = \underline{\hspace{2cm}}$**

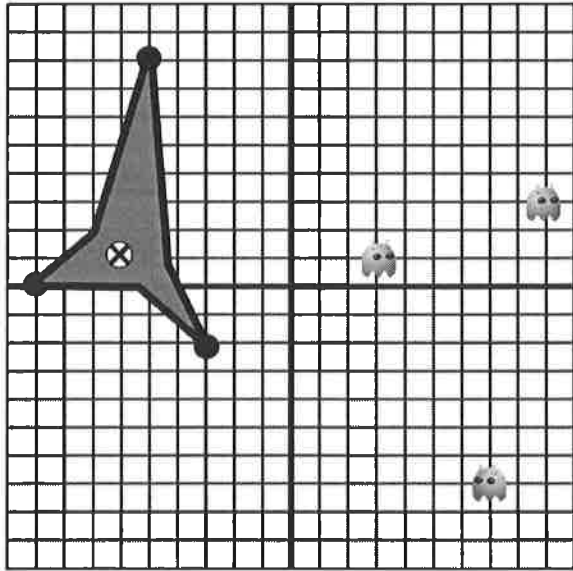
Scene #4 Amazon River -- Colombia



On a cruise, Optimus dove into the Amazon and took a dozen mutated, pregnant piranhas.

### EL ETERNAUTA vs. LAS YACUMAMAS

Famed South American Superhero El Eternauta needs to destroy three infamous Yacumamas, alien life forms that live in the Amazon River. Eternauta has a strangely shaped power blast and he only has one charge left and needs hit all of Las Yacumamas!



Which is a correct order of transformations that will allow El Eternauta to defeat Las Yacumamas?

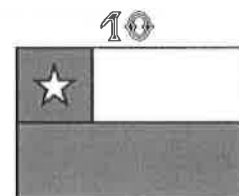
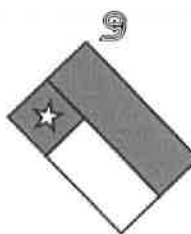
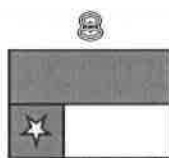
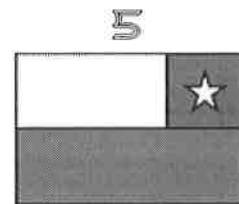
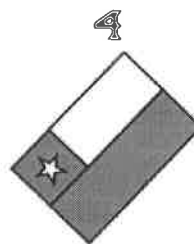
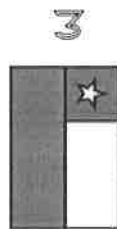
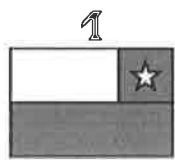
|  |                 |
|--|-----------------|
| Shift 12 units to the right, Shift 1 unit up, Reflect over x-axis  | <b>a = -100</b> |
| Shift 12 unit to the right, Shift 1 unit down, Reflect over x-axis | <b>c = -300</b> |
| Shift 1 unit up, Reflect over x-axis, shift 12 units to the right  | <b>e = -500</b> |

Scene #5 El Tatio Geysers -- Santiago, Chile

High in the Andes Mountains, Optimus filled a hundred balloons with pure geyser steam.



Find the transformed Chilean Flag to the left that meets these three requirements:  
**1) a congruent dilation    2) not a horizontal reflection    3) rotated clockwise 135°**



The number of the flag that meets the three requirements is equal to  $i$ .  **$i =$**



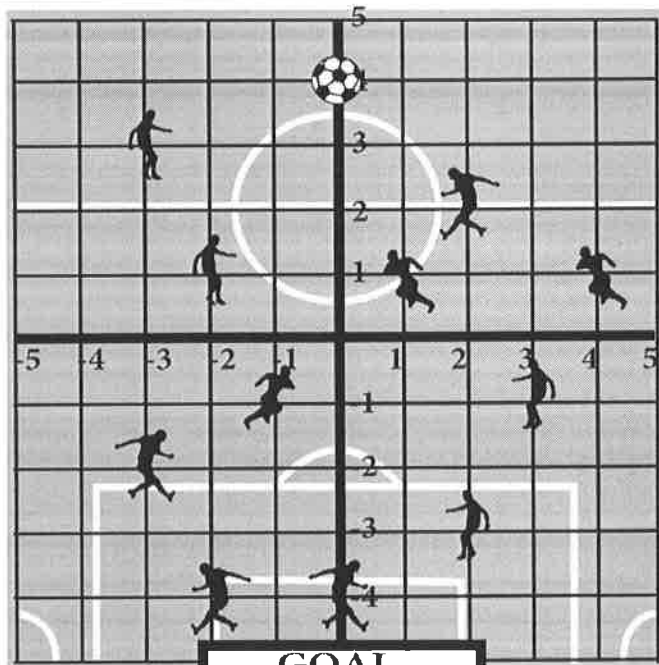


For Optimus's final heist, a crane and bulldozer were hotwired and taken from the stadium. It may only be a matter of time until the world conquering device is built and activated. Later, investigators were sent what may be the final cryptic text message.

The Mathemagicians are about to reach our GOOOOAAAAALLLLLL. Can you reach yours? **Which of these three sets of transformations will score a goal?** If the ball lands on a vertex with a player, the play fails. (All plays start at (0,4))

\*Hint:  
The ball must go in the goal, not hit the outside goal lines.

|               |   |
|---------------|---|
| <b>Play A</b> | 1. $(x + 1, y - 2)$<br>2. reflect over x-axis.<br>3. reflect over y-axis<br>4. $(x + 1, y - 2)$ |
| <b>Play C</b> | 1. $(x - 1, y - 3)$<br>2. reflect over y-axis.<br>3. reflect over x-axis<br>4. $(x + 1, y - 4)$ |
| <b>Play E</b> | 1. $(x - 3, y - 2)$<br>2. reflect over y-axis.<br>3. reflect over x-axis<br>4. $(x - 2, y - 3)$ |



**Which play scores?**

(This letter will be equal to 500)

\_\_\_\_\_ = 780

CRYPTIC PUZZLE SOLVER TEXT MESSAGE

Putting on the final touches, world ends soon. Love ya, Optimus Composite

M + A + T + E + M + A + T + I + C + A