SEMESTER ONE:
FINAL TEST REVIEW
Unit 1 Transformations

- For each Transformation, describe how each point should move.

1. $T: (x, y) \rightarrow (x + a, y + b)$:
   
   Every point moves $a$ units (left if $a$ is negative/right if $a$ is positive) and $b$ units (down if $b$ is negative and up if $b$ is positive).

2. $R_m$:
   
   Every point maps to its image, forming a line that is perpendicular to the line “$m$” (you would put the specific line for your problem in place of “$m$”), with both image and pre-image being equidistant (same distance) from the line “$m$”.
For each Transformation, describe how each point should move.

3. $R_{O, 90^\circ}$:
   Every point moves $90^\circ$ counterclockwise about the origin.

4. $H_O$:
   Every point moves $180^\circ$ about the origin (in either direction).
For each Transformation, describe how each point should move.

5. $D_{0,k}$:

Every point moves to a point “$k$” times the distance from the center $O$. 
Unit 1: Transformations

You may use the coordinate plane to determine each of the following. Identify the type of transformation and determine the image. Give your answer for the image as a coordinate point.

<table>
<thead>
<tr>
<th>Transformation Type</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. T: A (\rightarrow) ((x + 3, y - 5))</td>
<td>Translation ((-2,3))</td>
</tr>
<tr>
<td>11. R(_x): B (\rightarrow) ((-_,_))</td>
<td></td>
</tr>
<tr>
<td>12. R(_y): C (\rightarrow) ((-_,_))</td>
<td></td>
</tr>
<tr>
<td>13. R(_y=x): D (\rightarrow) ((-7,4))</td>
<td>Reflection ((4, -7))</td>
</tr>
<tr>
<td>14. R(_{90}): E (\rightarrow) ((-_,_))</td>
<td></td>
</tr>
<tr>
<td>15. R(_{90}): F (\rightarrow) ((-5,3))</td>
<td>Rotation ((3, -5))</td>
</tr>
<tr>
<td>16. D(_{0,3}): G (\rightarrow) ((-_,_))</td>
<td></td>
</tr>
<tr>
<td>17. D(_{0, -2}): H (\rightarrow) ((2,4))</td>
<td>Dilation ((-4, -8))</td>
</tr>
<tr>
<td>18. D(_{0, 1/2}): I (\rightarrow) ((-6,8))</td>
<td>Dilation ((-3, -4))</td>
</tr>
</tbody>
</table>
Recall some of the key terms from this section:

- **Point**
- **Line**
- **Plane**
- **Collinear**
- **Coplanar**
- **Intersect**
- **Contains**
- **Opposite**
- **Adjacent**
- **Segment Addition**
- **Angle Addition**
- **Midpoint**
- **Angle Bisector**
- **Supplementary**
- **Complementary**
- **Vertical**
- **Congruent**
Use these terms to fill in blanks:

1. \( FA + AH = FH \) by **Segment Addition** Postulate.
2. \( \angle BAF \cong \angle HAG \) because they are **Vertical** angles.
3. \( \angle FAB \) and \( \angle BAE \) are **Complementary** angles because they add up to \( 90^\circ \).
Unit 2: Geometric Vocabulary

- Be ready to solve equations using segment and angle addition:

3.) \( m < FOE = 3x - 1 \), \( m < EOD = 72^\circ \), and \( m < FOD = 6x + 11 \)
   \[
   3x - 1 + 72 = 6x + 11 \\
   3x + 71 = 6x + 11 \\
   3x = 60 \\
   x = 20
   \]

4.) \( EB = 6x - 8 \), \( OB = 12 \), and \( OE = 4x - 2 \)
   \[
   4x - 2 + 12 = 6x - 8 \\
   4x + 10 = 6x - 8 \\
   2x = 18 \\
   x = 9
   \]
Be ready for another round of proofs:

**Proof 1:**
Given: \( MP = NQ \)
Prove: \( MN = PQ \)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ( MP = NQ )</td>
<td>Given</td>
</tr>
<tr>
<td>2. ( NP = NP )</td>
<td>Reflexive</td>
</tr>
<tr>
<td>3. ( MP = MN + NP )</td>
<td>Segment Addition Postulate</td>
</tr>
<tr>
<td>( NQ = PN + PQ )</td>
<td>Substitution</td>
</tr>
<tr>
<td>( MN + NP = NP + PQ )</td>
<td></td>
</tr>
<tr>
<td>( MN = PQ )</td>
<td>Subtraction</td>
</tr>
</tbody>
</table>
Unit 4: Parallel Lines

- Use the properties of parallel lines to find angle measures. Remember the big three that we focused on in this unit:

  - Corresponding Angles are Congruent
    \[ \text{Corr. } \angle s \text{ are } \cong \]
  - Alternate Interior Angles (Alt. Int.) are Congruent
    \[ \text{Alt. Int. } \angle s \text{ are } \cong \]
  - Same-Side Interior Angles (S-S Int.) are Supplementary
    \[ S - S \text{ Int. } \angle s \text{ are supp.} \]
Unit 4: Parallel Lines

- Use those properties to make equations and find angle measures using a diagram (you may also be asked to explain your answers):

1. If $m \angle 1 = 115^\circ$, then $m \angle 2 = \text{115}^\circ$ because if $c \parallel d$, 
Corr. angles are $\approx$.

2. If $m \angle 5 = 70^\circ$, then $m \angle 8 = \text{70}^\circ$ because if $a \parallel b$, 
Alt. Int. angles are $\approx$.

3. If $m \angle 4 = 120^\circ$, then $m \angle 5 = \text{60}^\circ$ because if $c \parallel d$, 
S-S Int. angles are $\text{supp.}$.
Unit 4: Parallel Lines

- Use those properties to make equations and find angle measures using a diagram (you may also be asked to explain your answers):

- Ex: \( m < 8 = 4x + 12 \) and \( m < 2 = 6x - 4 \)

\[
\begin{align*}
4x + 12 &= 6x - 4 \\
16 &= 2x \\
8 &= x
\end{align*}
\]
Unit 4: Parallel Lines

- You can also use those properties to identify the existence of parallel lines in a diagram

1. $\angle 2 \cong \angle 9$
   
   $\overline{AB} \parallel \overline{FC}$

2. $m \angle 2 = m \angle 5$
   
   None

3. $\angle 6 \cong \angle 7$
   
   $\overline{EF} \parallel \overline{CD}$
You can also use those properties to identify the existence of parallel lines in a diagram.

4. \( m\angle 3 = m\angle 7 \)  
Yes; \( \overline{AB} \parallel \overline{EF} \)

Explain: Because when lines ACB and Corr. \(<\)'s are \( \equiv \), then \( \overline{AB} \parallel \overline{EF} \).
Unit 5: Triangles

- Remember the 5 Postulates/Theorems we use for Proving That Triangles are congruent:
  - Side-Side-Side \( \text{SSS} \)
  - Side-Angle-Side \( \text{SAS} \)
  - Angle-Side-Angle \( \text{ASA} \)
  - Angle-Angle-Side \( \text{AAS} \)
  - Hypotenuse-Leg \( \text{HL} \)

- Oh, and Let’s not forget about…
  \[ \text{CPCTC} \]
Use these postulates/theorems to label diagrams and name the appropriate congruent statements:

| S  | FI ≅ HI       |
| A  | < EIF ≅ < GIH |
| S  | EI ≅ GI       |

\[ \triangle EFI \cong \triangle GHI \]
Unit 5: Triangles

- Use these postulates/theorems to label diagrams and name the missing parts to satisfy them:

6. \( \angle B \cong \angle C \)

\( \frac{AB}{CD} \cong \frac{CD}{CD} \)

AAS Theorem
Unit 5: Triangles

- Use these postulates/theorems to label diagrams and name the missing parts to satisfy them:

9. $\overline{AB} \cong \overline{CD}$
   $\overline{AD} \cong \overline{BC}$

SSS Postulate
Unit 5: Triangles

- Use these postulates/theorems to label diagrams and name the appropriate congruent statements:

\[ \overline{DA} \cong \overline{BC}; \overline{DC} \cong \overline{BA} \]

\[ \triangle ABC \cong \triangle CDA \]

by \( SSS \)
Use these postulates/theorems to label diagrams and name the appropriate congruent statements:

\[ \triangle ABC \cong \triangle EDC \]
by \( AAS \)
Unit 6: Quadrilaterals

- Remember the properties of the Quadrilaterals, and how to use them to make equations.

Complete the chart by placing check marks in the appropriate places.

<table>
<thead>
<tr>
<th>Property</th>
<th>Parallelogram</th>
<th>Rectangle</th>
<th>Rhombus</th>
<th>Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Opposite sides are parallel</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2) Opposite sides are congruent</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3) Opposite angles are congruent</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>4) A diagonal forms two congruent angles</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>5) Diagonals bisect each other</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6) Diagonals are congruent</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>7) Diagonals are perpendicular</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>8) A diagonal bisects two angles</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>9) All angles are right angles</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>10) All sides are congruent</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
Unit 6: Quadrilaterals

- Remember the properties of the Quadrilaterals, and how to select the most best one from a given property.

Match each shape name to the properties it has. Answers will be repeated.

- [A] parallelogram
- [B] rectangle
- [C] rhombus
- [D] square
- [E] trapezoid

1. _______ opposite sides are congruent
2. _______ opposite angles are congruent
3. _______ diagonals are congruent
4. _______ all sides and angles are congruent
5. _______ diagonals are perpendicular
6. _______ diagonals are bisected
7. _______ angles are bisected
8. _______ all angles are right angles
9. _______ opposite sides are parallel
10. _______ not a parallelogram
Unit 6: Quadrilaterals

- And remember the Trapezoid...
- It is NOT a Parallelogram! It has its own Properties.
- Ex: Find the value of x in the figure.

\[ x + 10 = \frac{1}{2} (27 + 17) \]  (Why?)

\[ x + 10 = \frac{1}{2} (44) \]

\[ x + 10 = 22 \]

\[ x = 12 \]