Essentials of Geometry

Use Figure A to identify the following:

1. Give another name for line $h$
2. Give another name for plane $M$
3. Name a point that is not coplanar with $A$, $B$, and $F$

Use Figure B to identify the angle pairs.

4. A pair of vertical angles
5. A pair of complementary angles
6. A pair of supplementary angles
7. A pair of adjacent angles
8. Find the length of $RS$ for the coordinates:
   $R \ (1, 6), \ S \ (6, 18)$
   $RS = \_\_\_\_\_$
9. Find the midpoint of RS using the given coordinates.

   \( R (-2, 3), S (3, -7) \)

   Midpoint = ( _____, _____ )

10. Use the linear equation at the right to write the equation of the line that is:

   \( y = -\frac{3}{5}x + 4 \)

   a. parallel
   b. parallel, and passes through \((0, 3)\)
   c. perpendicular
   d. perpendicular and passes through \((0, -8)\)

   a. \( y = \) _________________
   b. \( y = \) _________________
   c. \( y = \) _________________
   d. \( y = \) _________________

11. M is the midpoint of segment AB. Find each missing length:

   a. MB = 27: \( AB = \) _______
      \( AM = \) _______
   b. \( AB = 6x - 2 \)
      \( MB = \) _______
      \( AM = \) _______

   Use the protractor to measure and classify each angle as acute, obtuse, straight, or right.

<table>
<thead>
<tr>
<th>Angle</th>
<th>Measure</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \angle JNK )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \angle KNM )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \angle LNM )</td>
<td></td>
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</tbody>
</table>
Deductive Reasoning

(3 questions; 20 points)

1. Use the information to complete the chart:

   Hypothesis: it snows all night
   Conclusion: we will have a snow day tomorrow

<table>
<thead>
<tr>
<th>Conditional</th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Converse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inverse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contrapositive</td>
<td></td>
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</tbody>
</table>

2. Assume that the following statements are true. Use the Law of Detachment to write another true statement.

   a. All prime numbers have exactly two divisors. The number 607 is a prime number.

   _______________________________

   b. All rectangles are quadrilaterals. ABCD is a rectangle.

   _______________________________

3. Assume that the following statements are true. Use the Law of Syllogism (Chain Rule) to write a conclusion.

   a. If it is raining, then the sky is cloudy. If the sky is cloudy, then you can’t see the sun.

   _______________________________

   b. If a figure is a square, then it is a rectangle. If a figure is a rectangle, then it has 4 right angles.

   _______________________________

END Reasoning & Proof
**Parallel Lines & Transversals**

Use the given information to identify the angle pairs and their relationship to one another.

<table>
<thead>
<tr>
<th>Angle Pair</th>
<th>Type of Angle Pair</th>
<th>Congruent or Supplementary?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. $\angle 1 &amp; \angle 5$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. $\angle 4 &amp; \angle 5$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. $\angle 4 &amp; \angle 6$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. $\angle 3 &amp; \angle 7$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. $\angle 6 &amp; \angle 8$</td>
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</tbody>
</table>

Using the figure above, find the value of $X$ for which line $m$ is parallel to line $n$.

5. $m\angle 2 = 3x; m\angle 6 = 117^\circ$

   $X = \underline{\phantom{0000}}$

6. $m\angle 4 = 97^\circ; m\angle 5 = 4x + 3$

   $X = \underline{\phantom{0000}}$
### Triangles: Angle Measurements, Congruence, Correspondence

Use the figure below to find the angle measurements:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1. $m \angle 2 =$</td>
<td>[ \text{Given: } \angle 1 = 113^\circ; \angle 3 = 81^\circ ]</td>
</tr>
<tr>
<td>2. $m \angle 4 =$</td>
<td></td>
</tr>
<tr>
<td>3. $m \angle 5 =$</td>
<td></td>
</tr>
<tr>
<td>4. $m \angle 6 =$</td>
<td></td>
</tr>
</tbody>
</table>

Complete the congruence statement for the figures.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$ABCD \cong ____$</td>
<td>$\triangle QRS \cong ____$</td>
</tr>
</tbody>
</table>

Continued
Triangle Congruence Postulates

Decide which method, SAS, ASA, AAS, or HL, can be used to prove the triangles are congruent.

Similarity

Use the diagram and the given information to find the unknown length.

Determine if the triangles are similar; if they are, write a similarity statement.
Right Triangles

Use the Pythagorean Theorem to find the unknown side length.

\[ a^2 + b^2 = c^2 \]

\[
\begin{array}{c}
\text{28} \\
\text{45}
\end{array}
\]

Special Right Triangles

\[ 45 - 45 - 90: \quad \_\_\_ \quad \_\_\_ \quad \_\_\_ \]

\[ 30 - 60 - 90: \quad \_\_\_ \quad \_\_\_ \quad \_\_\_ \]

\[
\begin{array}{c}
X = \_\_\_ \\
X = \_\_\_ \\
X = \_\_\_ \\
Y = \_\_\_
\end{array}
\]

Trigonometry

Sine: \_\_\_ \_\_\_\_\_\_\_\_

Cosine: \_\_\_ \_\_\_\_\_\_\_

Tangent: \_\_\_ \_\_\_\_\_\_\_

\[
\begin{array}{c}
15 \\
49!
\end{array}
\]

\[
\begin{array}{c}
62! \\
18
\end{array}
\]

\[
\begin{array}{c}
38! \\
4
\end{array}
\]
Polygons

Use the formula to find the sum of the measures of the interior angles. \(180(n - 2)\)

<table>
<thead>
<tr>
<th>Decagon</th>
<th>Heptagon</th>
<th>18 – gon</th>
<th>30 – gon</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

What is the sum of the exterior angles, one at each vertex for each of these polygons?

Quadrilaterals

Classify the special quadrilateral. Then find the values of \(x\) and \(y\).

Type of quad: \(x = \) \(y = \)

Type of quad: \(x = \) \(y = \)

Type of quad: \(x = \) \(y = \)

Type of quad: \(x = \) \(y = \)
Circles

Find the measure of each arc.

\[ \overline{JM} \text{ and } \overline{KN} \text{ are diameters.} \]

Find the measure of the given arc or variable.

Equation of a Circle: \( (x - h)^2 + (y - k)^2 = r^2 \)

() is the _________ and \( r \) is the ___________.

Write the standard equation of the circle with the given center and radius.

Center \((-4, 7)\), radius 6

Graph the (circle) equation.

1. Plot the center.
2. Find the radius.
3. Count the radius in each direction from the center to find points on the edge.
4. Sketch the circle.
Additional notes/questions/formulas to remember: