1. Give an alternate name for angle $\angle 2$ using 3 points: $\angle GBC \text{ or } \angle CBG$

2. Angles $\angle ABE$ and $\angle CBG$ can best be described as: VERTICAL ANGLES (CONGRUENT)

3. Angles $\angle 6$ and $\angle 3$ can best be described as: ALTERNATING INTERIOR ANGLES (CONGRUENT)

4. The line $\overline{GH}$ can best be described as a: TRANSVERSAL LINE

5. Which angle corresponds to $\angle DEB$ : $\angle 1 \text{ OR } \angle ABG \text{ OR } \angle GBA$

6. Angles $\angle FEB$ and $\angle CBE$ can best be described as: CONSECUTIVE INTERIOR ANGLES (SUPPLEMENTARY)

7. Angles $\angle 1$ and $\angle 8$ can best be described as: ALTERNATE EXTERIOR ANGLES (CONGRUENT)

8. Which angle is an alternate interior angle with $\angle CBE$ : $\angle 5 \text{ OR } \angle DEB \text{ OR } \angle BED$

9. Angles $\angle GBC$ and $\angle BEF$ can best be described as: CORRESPONDING ANGLES (CONGRUENT)

10. Angles $\angle 2$ and $\angle 8$ can best be described as: CONSECUTIVE EXTERIOR ANGLES (SUPPLEMENTARY)

11. Which angle is an alternate exterior angle with $\angle ABG$ : $\angle 8 \text{ OR } \angle HEF \text{ OR } \angle FEB$

12. Which angle is a vertical angle to $\angle ABG$ : $\angle 4 \text{ OR } \angle CBE \text{ OR } \angle EBC$

13. Which angle can be described as consecutive exterior angle with $\angle 1$ : $\angle 7 \text{ OR } \angle DEH$

14. Any two angles that sum to 180° can be described as SUPPLEMENTARY angles.
TRIANGLES' INTERIOR ANGLE SUM

1. a. First, Create a random triangle on a piece of patty papers.

b. Using your pencil, write a number inside each interior angle a label.

c. Next, cut out the triangle.

d. Finally, tear off or cut each of the angles from the triangle.

e. Using tape, carefully put all 3 angles next to one another so that they all have the same vertex and the edges are touching but they aren’t overlapping.

Paste or Tape your 3 vertices here:

2. What is the measure of a straight angle or the angle that creates a line by using two opposite rays from a common vertex?

3. Collectively does the sum of your 3 interior angles of a triangle form a straight angle? What about others in your class? YES MINE DOES AND SO DO ALL OF THE OTHER EXAMPLES.

4. Make a conjecture about the sum of the interior angles of a triangle. Do you think your conjecture will always be true? (please explain using complete sentences)

   BASED ON THE EXAMPLES I HAVE SEEN IT APPEARS THAT THE SUM OF THE INTERIOR ANGLES OF A TRIANGLE WILL BE 180°.
5. More formally, why do the 3 interior angles of any triangle sum to 180°?

Consider \(\triangle ABC\). The segment \(AB\) is extended into a line and a parallel line is constructed through the opposite vertex. So, \(AB \parallel CD\).

a. Why is \(\angle 1 \cong \angle 2\)? \text{ALTERNATING INTERIOR ANGLES}\n
b. Why is \(\angle 5 \cong \angle 4\)? \text{ALTERNATING INTERIOR ANGLES}\n
c. Why is \(m\angle 2 + m\angle 3 + m\angle 4 = 180°\)? \text{8/6 THEY FORM A STRAIGHT ANGLE OR A LINE (180°)}
d. Using substitution we can replace \(m\angle 2\) with \(m\angle 1\) and \(m\angle 4\) with \(m\angle 5\) to show that the interior angles of a triangle must always sum to 180°.

\[
(m\angle 1) + m\angle 3 + (m\angle 5) = 180°
\]

Write the angle number in the ____ and then write the letter that corresponds with the number based on the code at the bottom in the box.

7. Angle 2 and Angle \(\boxed{7 \text{ E}}\) are alternate exterior angles.
8. Angle 7 and Angle \(\boxed{2 \text{ U}}\) are alternate exterior angles.
9. Angle 4 and Angle \(\boxed{8 \text{ C}}\) are corresponding angles.
10. Angle 5 and Angle \(\boxed{5 \text{ L}}\) are consecutive interior angles.
11. Angle 3 and Angle \(\boxed{6 \text{ I}}\) are alternate interior angles.
12. Angle 7 and Angle \(\boxed{1 \text{ D}}\) are consecutive exterior angles.
13. Angle 6 and Angle \(\boxed{7 \text{ E}}\) are vertical angles.
14. Angle 2 and Angle \(\boxed{4 \text{ A}}\) are a linear pair and on the same side of the transversal.
15. Angle 1 and Angle \(\boxed{5 \text{ N}}\) are corresponding angles.

\[1=D \quad 2=U \quad 3=L \quad 4=A \quad 5=N \quad 6=I \quad 7=E \quad 8=C\]

What type of Geometry is this? \text{EUCLIDEAN}
16. Given lines p and q are parallel, find the value of $x$ that makes each diagram true.

![Diagram 16a](image1)

**Alternate Exterior Angles**

A.E.A. (Congruent)

$x = 140^\circ$

![Diagram 16b](image2)

**Consecutive Exterior Angles**

C.E.A. (Supplementary)

$x = 25$

17. Given lines p and q are parallel, find the value of $x$ that makes each diagram true.

![Diagram 17a](image3)

**Corresponding Angles**

Congruent

$2x + 45 = 6x + 5$

$-2x - 5 = -2x - 5$

$40 = 4x$

$x = 10$

![Diagram 17b](image4)

**Consecutive Interior Angles**

C.I.A.

$(2x + 15) + (6x + 5) = 180$

$8x + 20 = 180$

$8x = 160$

$x = 20$

18. Given lines m and n are parallel, find the value $y$ of that makes each diagram true.

![Diagram 18a](image5)

**Corresponding Angles**

$y + 40 = 130$

$-40 - 40$

$y = 90$

![Diagram 18b](image6)

$\alpha + 50 + 40 = 180$

$\Rightarrow \alpha = 90$

$\beta + 90 = 180$

$\Rightarrow \beta = 90$

$\gamma = 90$
19. **ANGLE PUZZLE. Find m$\angle AEF$**

Given:
- $m\angle DEF = 85^\circ$
- $m\angle ABG = 50^\circ$
- $\angle BAE$ is a right angle
- $\angle CGE$ and $\angle DEG$ are supplementary

$m\angle AEF = \boxed{140^\circ}$

20. **Converse of AIA, AEA, CIA, CEA. Which sets of lines are parallel and explain why?**

a. 

\[75^\circ\]

\[105^\circ\]

**By the converse of C.I.A.**

We know line $m\parallel$ line $n$

b. 

\[54^\circ\]

\[56^\circ\]

**By converse of corresponding angles line $g$ $\parallel$ line $t$**

Symbol for not parallel

c. 

\[70^\circ\]

\[120^\circ\]

$180 + 70 = 190^\circ$

Not $180^\circ$ x

**By converse C.E.A.**

$p \parallel q$

d. 

\[60^\circ\]

\[120^\circ\]

$X + X + X = 180$

\[\frac{3X}{3} = 180\]

X = 60

**By converse of corresponding angles**

$g \parallel h$