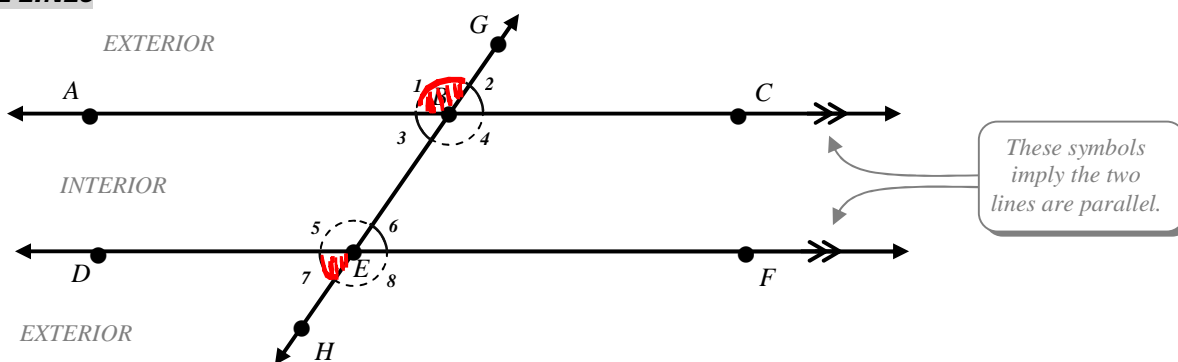


PARALLEL LINES



WORD BANK:

Alternate Interior Angles

$\angle DEH$

$\angle HEF$

Corresponding Angles

Supplementary

$\angle GBC$

$\angle 5$

Transversal

Vertical Angles

Consecutive Exterior Angles

Consecutive Interior Angles

Congruent

$\angle 4$

Alternate Exterior Angles

$\angle ABG$

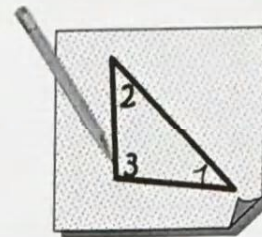
1. Give an alternate name for angle $\angle 2$ using 3 points: $\angle GBC$ or $\angle CBG$
2. Angles $\angle ABE$ and $\angle CBG$ can best be described as: VERTICAL ANGLES (CONGRUENT)
3. Angles $\angle 6$ and $\angle 3$ can best be described as: ALTERNATING INTERIOR ANGLES (CONGRUENT)
4. The line \overleftrightarrow{GH} can best be described as a: TRANSVERSAL LINE
5. Which angle corresponds to $\angle DEB$: $\angle 1$ OR $\angle ABG$ 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 $\angle CBE$: $\angle 5$ OR $\angle DEB$ 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 $\angle ABG$: $\angle 8$ OR $\angle HEF$ OR $\angle FEH$
12. Which angle is a vertical angle to $\angle ABG$: $\angle 4$ OR $\angle CBE$ OR $\angle EBC$
13. Which angle can be described as consecutive exterior angle with $\angle 1$: $\angle 7$ OR $\angle DEH$
14. Any two angles that sum to 180° can be described as SUPPLEMENTARY angles.

COMPLEMENTARY ANGLES

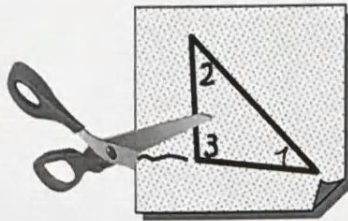
180 SUPPLEMENTARY

TRIANGLE'S INTERIOR ANGLE SUM

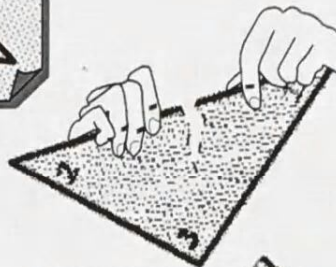
1. a. First, Create a random triangle on a piece of patty papers.
- b. Using your pencil, write a number inside each interior angle a label.



- c. Next, cut out the triangle.



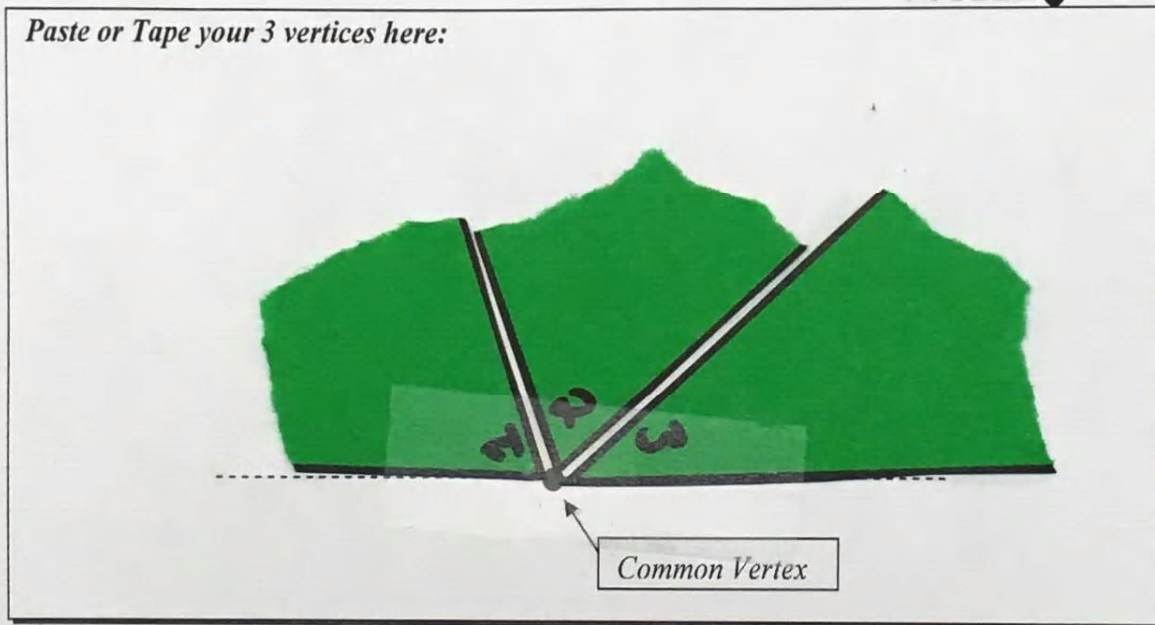
- d. Finally, tear off or cut each of the angles from the triangle



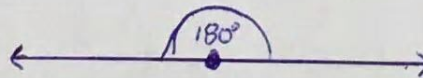
- e. Using tape, carefully put all 3 angles next to one another so that they all have the same vertex and the edges are touching but they aren't overlapping



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?



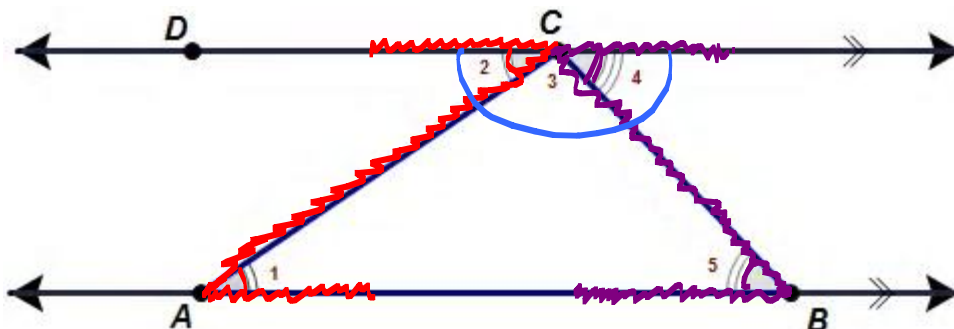
3. Collectively does the sum of your 3 interior angles of a triangle form a straight angle? What about others in your class?

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° ?



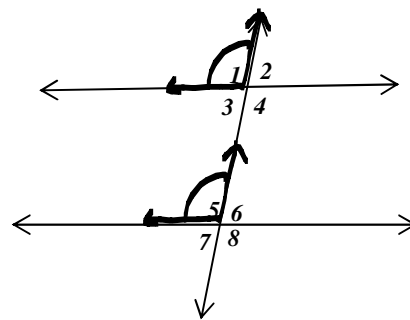
Consider $\triangle ABC$. The segment \overline{AB} is extended into a line and a parallel line is constructed through the opposite vertex. So, $\overline{AB} \parallel \overline{CD}$.

- a. Why is $\angle 1 \cong \angle 2$? ALTERNATING INTERIOR ANGLES \cong
- b. Why is $\angle 5 \cong \angle 4$? ALTERNATING INTERIOR ANGLES \cong
- c. Why is $m\angle 2 + m\angle 3 + m\angle 4 = 180^\circ$? B/C 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° .

$$(m\angle 1) + m\angle 3 + (m\angle 5) = 180^\circ$$

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.

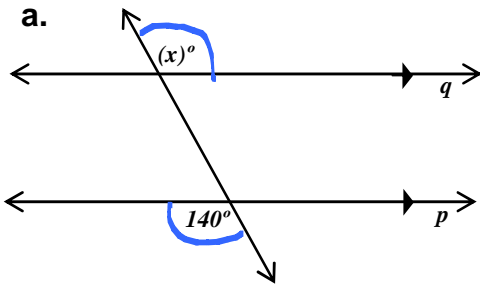
7. Angle 2 and Angle 7 E are alternate exterior angles.
8. Angle 7 and Angle 2 U are alternate exterior angles.
9. Angle 4 and Angle 8 C are corresponding angles.
10. Angle 5 and Angle 3 L are consecutive interior angles.
11. Angle 3 and Angle 6 I are alternate interior angles.
12. Angle 7 and Angle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



1=D	2=U	3=L	4=A	5=N	6=I	7=E	8=C
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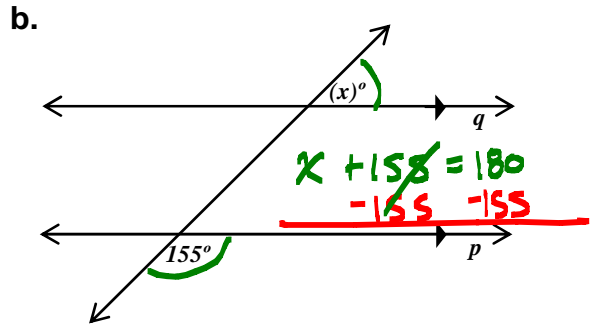
What type of Geometry is this? EUCLIDEAN

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



ALTERNATE EXTERIOR ANGLES
A.E.A. (CONGRUENT)

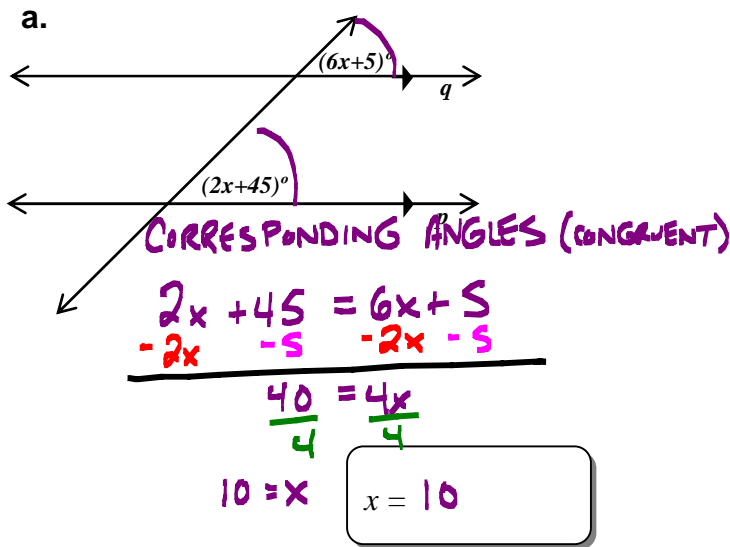
$$x = 140^\circ$$



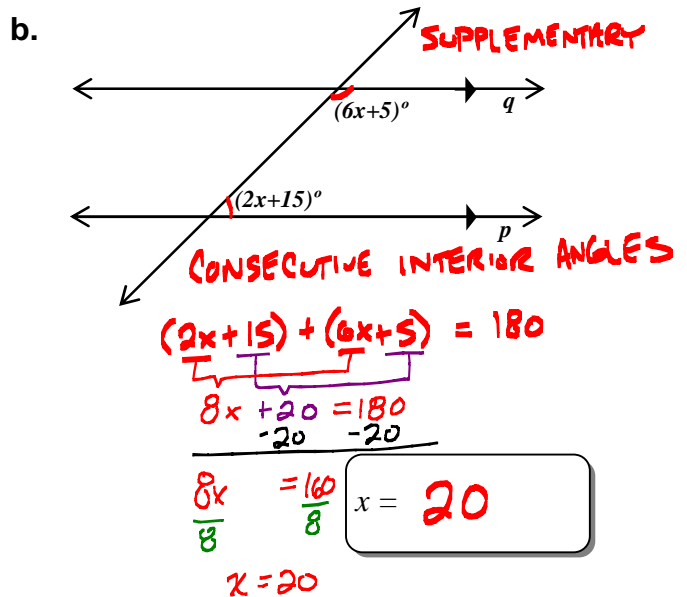
CONSECUTIVE EXTERIOR ANGLES
C.E.A. (SUPPLEMENTARY)

$$x = 25$$

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

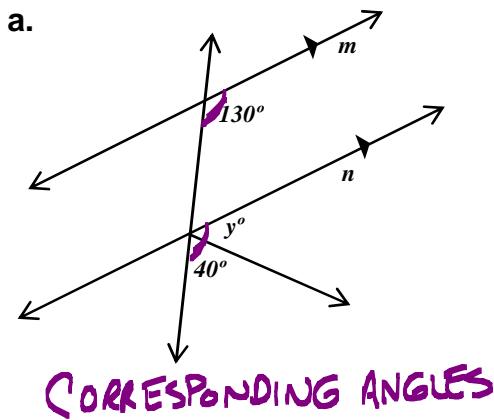


$$x = 10$$



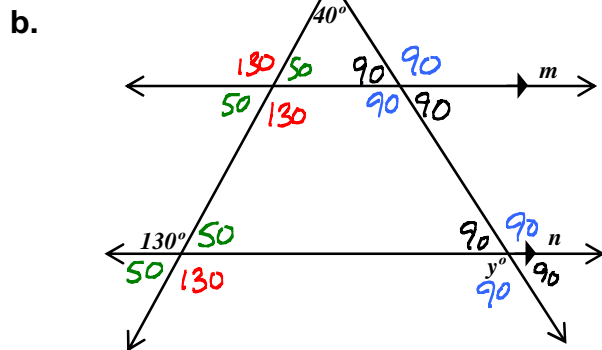
$$x = 20$$

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



$$\begin{array}{r} y + 40 = 130 \\ -40 \quad -40 \\ \hline y = 90 \end{array}$$

$$y = 90$$



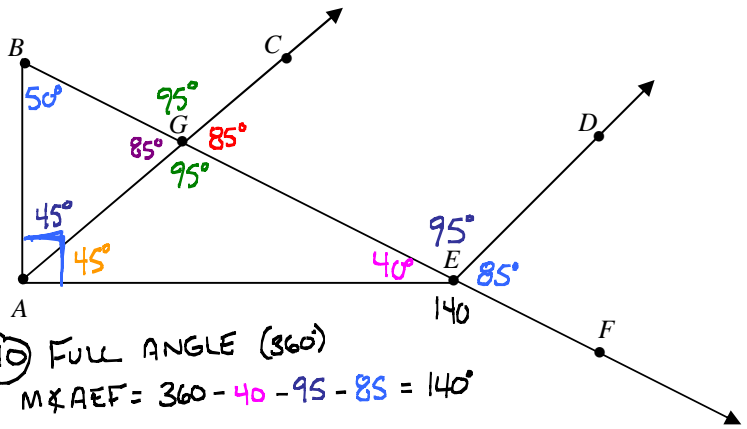
$$\begin{array}{r} a + 50 + 40 = 180 \\ a + 90 = 180 \\ -90 \quad -90 \\ \hline a = 90 \end{array}$$

$$y = 90^\circ$$

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 (SUMS TO 180)



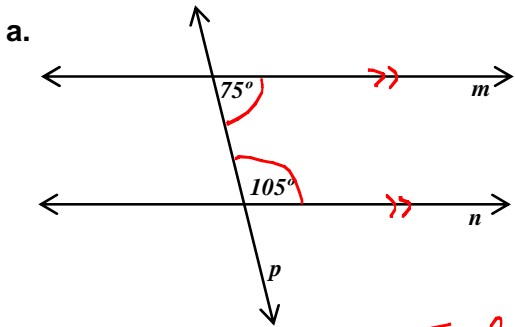
$m\angle AEF =$

140

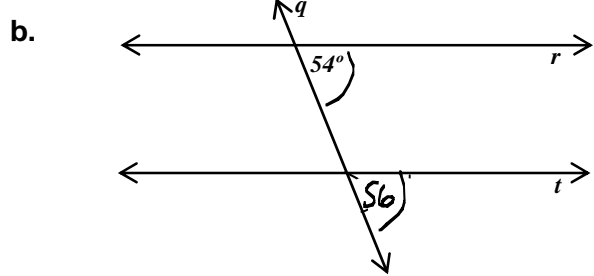
#10 FULL ANGLE (360°)
 $m\angle AEF = 360 - 40 - 95 - 85 = 140$

- #1 $\angle DEF$ & $\angle DEG$ LINEAR PAIR
 $m\angle DEG = 180 - 85$
 $m\angle DEG = 95^\circ$
- #2 $\angle CGE$ & $\angle DEG$ SUPPLEMENTARY
 $m\angle CGE = 180 - 95$
 $m\angle CGE = 85^\circ$
- #3 VERTICAL ANGLES
 $m\angle BGA = 85^\circ$
- #4 $\angle BGC$ & $\angle CGE$ LINEAR PAIR
 $m\angle BGE = 180 - 85$
 $m\angle BGE = 95^\circ$
- #5 VERTICAL ANGLES
 $m\angle AGE = 95^\circ$
- #6 $\triangle BAG$ INTERIOR ANGLES SUM TO 180
 $m\angle BAG = 180 - 50 - 85$
 $m\angle BAG = 45^\circ$
- #7 RIGHT ANGLE
 $m\angle GAE = 90 - 45$
 $m\angle GAE = 45^\circ$
- #8 $\triangle AGE$ INT. ANGLES
 $m\angle AEG = 180 - 45 - 95$
 $m\angle AEG = 40^\circ$

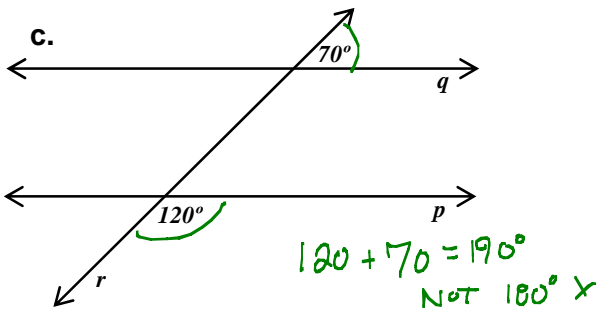
20. Converse of AIA, AEA, CIA, CEA. Which sets of lines are parallel and explain why?



BY THE CONVERSE OF C.I.A.
 WE KNOW LINE $m \parallel$ LINE n
 ↑
 SYMBOL FOR PARALLEL

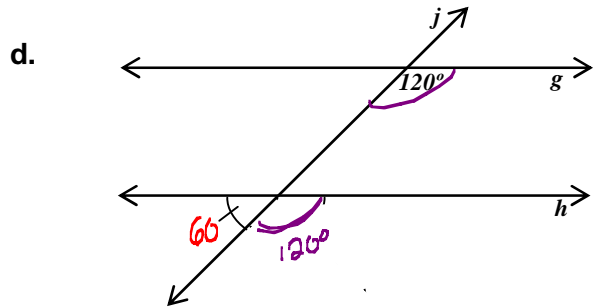


BY CONVERSE OF CORRESPONDING ANGLES LINE $r \not\parallel$ t
 ↑
 SYMBOL FOR NOT PARALLEL



$120 + 70 = 190^\circ$
 NOT $180^\circ \times$

BY CONVERSE C.E.A.
 $p \not\parallel q$



$x + x + x = 180$
 $\frac{3x}{3} = \frac{180}{3}$
 $x = 60$

BY CONVERSE OF CORRESPONDING ANGLES
 $g \parallel h$