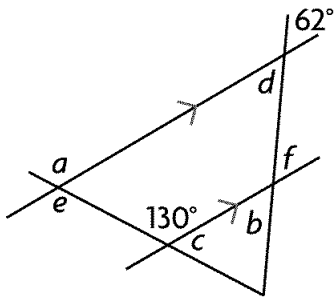


Multiple Choice

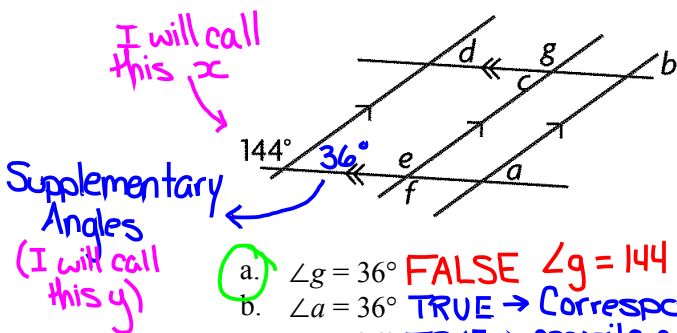
Identify the choice that best completes the statement or answers the question.

- A 1. Which statement about the angles in this diagram is false?



- a. $\angle b = 50^\circ$ **FALSE** $\rightarrow \angle b = 62^\circ$ \rightarrow Alternate Exterior Angles OR vertically opposite to $\angle f$
 b. $\angle c = 50^\circ$ **TRUE** \rightarrow Supplementary Angles
 c. $\angle e = 130^\circ$ **TRUE** \rightarrow Alternate Interior
 d. $\angle f = 62^\circ$ **TRUE** \rightarrow Corresponding Angles

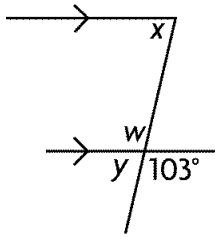
- A 2. Which statement about the angles in this diagram is false?



- a. $\angle g = 36^\circ$ **FALSE** $\angle g = 144^\circ \rightarrow$ Co-Interior to $\angle d$ which is 36°
 b. $\angle a = 36^\circ$ **TRUE** \rightarrow Corresponding to y .
 c. $\angle c = 36^\circ$ **TRUE** \rightarrow opposite angle (to y) in parallelogram
 d. $\angle d = 36^\circ$ **TRUE** \rightarrow Corresponding to y

C

3. Which are the correct measures of the indicated angles?

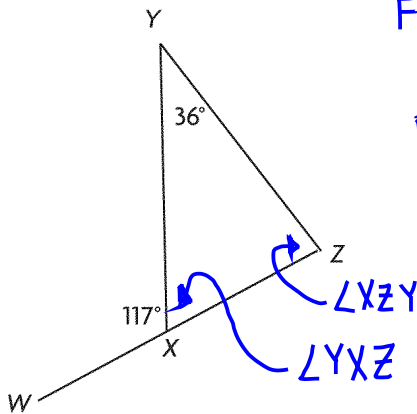


$w = 103^\circ$ Vertically Opposite \rightarrow OR Supplementary if you find "y" first
 $y = 77^\circ$ Supplementary Angles \rightarrow OR Angles on a Line
 $x = 77^\circ$ Corresponding Angles (to "y") \rightarrow OR Co-Int Angle to "w"

- a. $\angle w = 77^\circ, \angle x = 77^\circ, \angle y = 103^\circ$
- b. $\angle w = 77^\circ, \angle x = 103^\circ, \angle y = 103^\circ$
- c. $\angle w = 103^\circ, \angle x = 77^\circ, \angle y = 77^\circ$**
- d. $\angle w = 103^\circ, \angle x = 103^\circ, \angle y = 77^\circ$

C

4. Which are the correct measures for $\angle YXZ$ and $\angle XZY$?



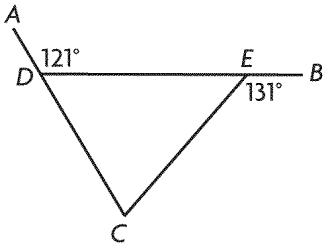
Find $\angle XZY$ First:
 $\angle XZY = 81^\circ$
 Exterior Angle of Δ is equal to sum of opposite interior angles.
 $\angle YXZ = 63^\circ$
 Angle Sum Δ OR Supplementary Angles

OR Find $\angle YXZ$ First:
 $\angle YXZ = 63^\circ$
 Supplementary Angles
 $\angle XZY = 81^\circ$
 Angle Sum Δ
 or The sum of 2 interior angles of a triangle is equal to opposite exterior angle.

- a. $\angle YXZ = 63^\circ, \angle XZY = 91^\circ$
- b. $\angle YXZ = 53^\circ, \angle XZY = 91^\circ$
- c. $\angle YXZ = 63^\circ, \angle XZY = 81^\circ$**
- d. $\angle YXZ = 53^\circ, \angle XZY = 81^\circ$

D

5. Which are the correct measures of the interior angles of $\triangle CDE$?



- a. $\angle DCE = 92^\circ$, $\angle CDE = 49^\circ$, and $\angle CED = 39^\circ$
- b. $\angle DCE = 52^\circ$, $\angle CDE = 69^\circ$, and $\angle CED = 59^\circ$
- c. $\angle DCE = 62^\circ$, $\angle CDE = 49^\circ$, and $\angle CED = 69^\circ$
- d. $\angle DCE = 72^\circ$, $\angle CDE = 59^\circ$, and $\angle CED = 49^\circ$

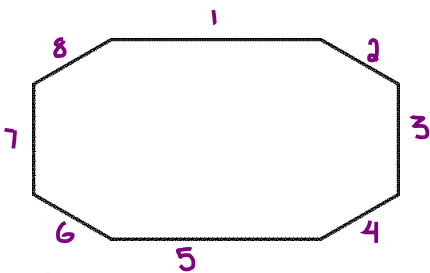
$\angle CDE = 59^\circ$ Supplementary Angles
(or Angles on a line)

$\angle CED = 49^\circ$ Supplementary Angles
(or Angles on a line)

$\angle DCE = 72^\circ$ Angle Sum of Triangle

A

6. Determine the sum of the measures of the interior angles of this polygon.



- a. 1080°
- b. 1440°
- c. 720°
- d. 540°

Sum of Interior Angles of Polygon = $180(n-2)$

This Polygon has 8 sides, so $n=8$

$$\begin{aligned} \text{Angle Sum} &= 180(8-2) \\ &= 180(6) \\ &= 1080^\circ \end{aligned}$$

A

7. Each interior angle of a regular convex polygon measures 144° . How many sides does the polygon have?

- a. 10
- b. 11
- c. 8
- d. 9

This means all the angles are equal
so $n \times 144^\circ = \text{Total Sum of Interior Angles}$

Sum of All Interior Angles = $180(n-2)$

$$n \times 144 = 180(n-2)$$

$$144n = 180n - 360$$

$$\begin{aligned} & -144n \quad -144n \\ 0 &= 36n - 360 \end{aligned}$$

$$+360 \quad +360$$

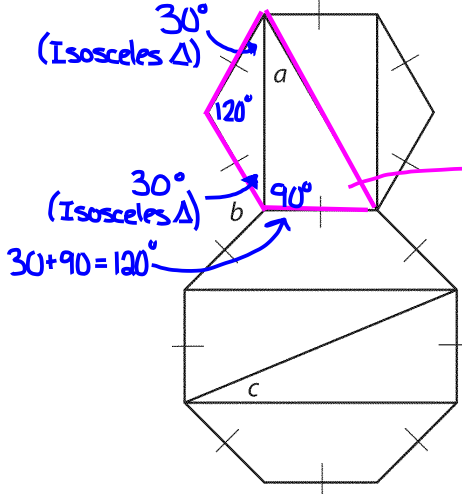
$$\frac{360}{36} = \frac{36n}{36}$$

$$10 = n$$

This means the polygon has 10 sides

A

8. Determine the value of a .



Top Polygon is Regular Hexagon.
 Interior Angle Sum = $180(n-2)$
 $= 180(6-2)$
 $= 180(4)$
 $= 720^\circ$

Bottom Polygon is Regular Octagon.
 Interior Angle Sum = $180(n-2)$
 $= 180(8-2)$
 $= 180(6)$
 $= 1080^\circ$

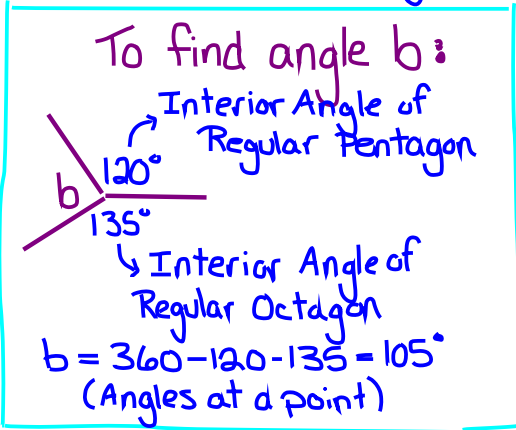
Each Angle = $720 \div 6 = 120^\circ$

Each Angle = $1080 \div 8 = 135^\circ$

This is an Isosceles Trapezoid The two Angles opposite the equal sides are equal so these must both be 60° .

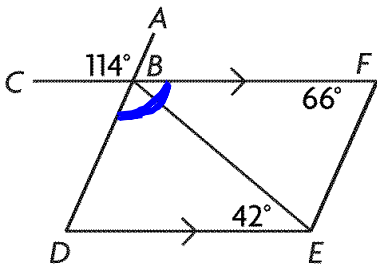
This means the 30° angle plus angle a must be 60° so Angle $a = 30^\circ$

- a. 30°
- b. 35°
- c. 45°
- d. 25°



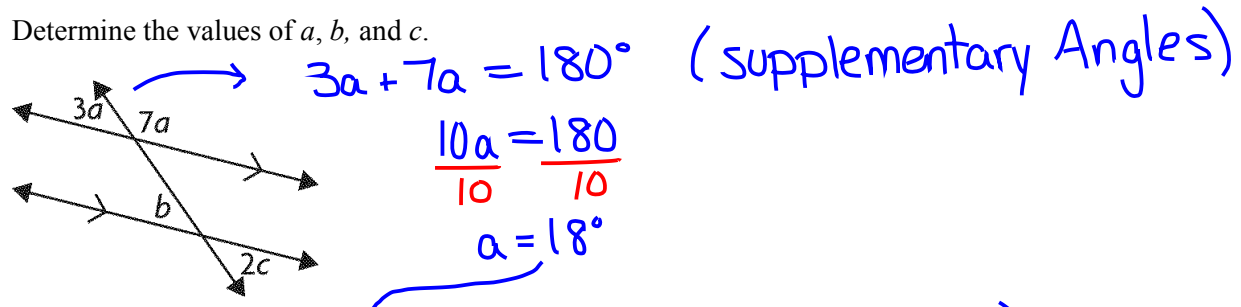
Short Answer

9. Determine the measure of $\angle DBF$.



$\angle DBF = 114^\circ$
 Vertically Opposite Angles are equal.

10. Determine the values of a , b , and c .



$3a + 7a = 180^\circ$ (Supplementary Angles)

$$\frac{10a}{10} = \frac{180}{10}$$

$a = 18^\circ$

$3a = b$ (Corresponding Angles)

$3(18) = b$

$54^\circ = b$

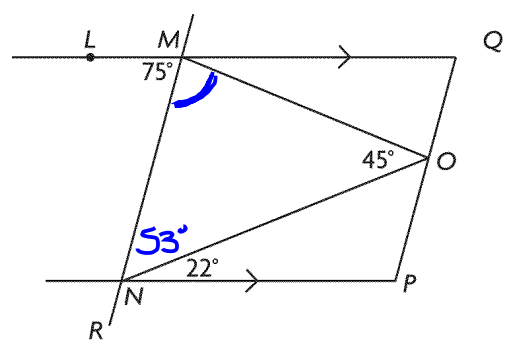
$b = 2c$ (Vertically Opposite)

$$\frac{54}{2} = \frac{2c}{2}$$

$27^\circ = c$

$a = 18^\circ$
 $b = 54^\circ$
 $c = 27^\circ$

11. Determine the measure of $\angle NMO$.

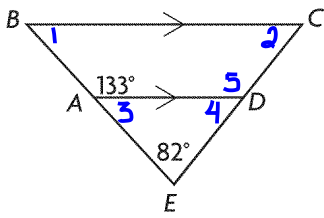


$\angle MNP = 75^\circ$ Alternate Interior Angles

$\angle MNO = 53^\circ$ ($75^\circ - 22^\circ$)

$\angle NMO = 82^\circ$ Angle Sum of \triangle

12. Determine the unknown angles.



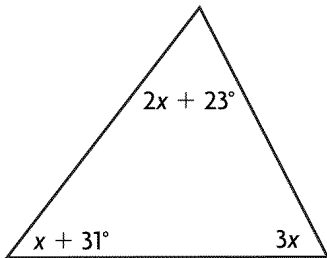
$\angle 1 = 47^\circ$ Co-Interior Angles Add to 180°
 $\angle 3 = 47^\circ$ Corresponding Angles are Equal
 (or Supplementary Angles)

$\angle 4 = 51^\circ$ Angle Sum of Triangle

$\angle 2 = 51^\circ$ Corresponding Angles
 (or Angle Sum of Large Δ)

$\angle 5 = 129^\circ$ Supplementary Angles Add to 180°
 (or Co-Interior Angles or Angle Sum
 of Quadrilateral)

13. Determine the value of x .



Angle sum of Triangle = 180°

$$(x+31) + (2x+23) + 3x = 180^\circ$$

$$x + 31 + 2x + 23 + 3x = 180^\circ$$

$$6x + 54 = 180^\circ$$

$$\begin{array}{r} -54 \\ -54 \end{array}$$

$$\frac{6x}{6} = \frac{126}{6}$$

$$x = 21^\circ$$

14. Determine the sum of the measures of the angles in a 13-sided convex polygon.
Show your calculation.

$$\text{Sum Interior Angles} = 180(n-2)$$

$$13 \text{ sides means } n=13$$

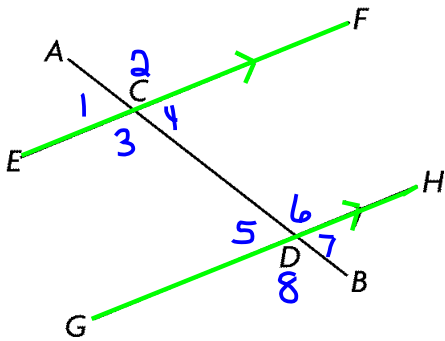
$$\text{Angle Sum} = 180(13-2)$$

$$= 180(11)$$

$$= 1980^\circ$$

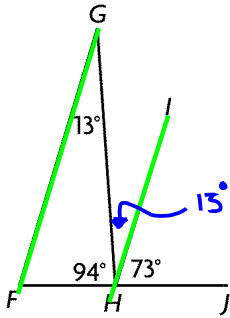
Problem

15. Describe four different methods to prove $EF \parallel GH$.



- If any of the corresponding Angles are equal then EF must be parallel to GH .
($1=5$, $2=6$, $3=8$ or $4=7$)
- If Co-Interior Angles add to 180° then EF must be parallel to GH .
($3+5=180^\circ$ or $4+6=180^\circ$)
- If Alternate Interior Angles turn out to be equal then EF must be parallel to GH .
($3=6$ or $4=5$)
- If Alternate Exterior Angles are equal then EF must be parallel to GH . ($2=8$ or $1=7$)
- If Co-Exterior Angles add to 180° then EF must be parallel to GH .
($1+8=180^\circ$ or $2+7=180^\circ$)

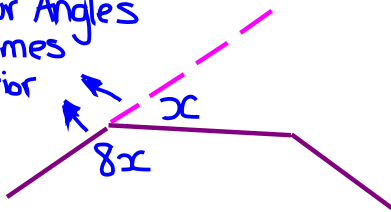
16. Prove: $FG \parallel HI$



$\angle GHI = 13^\circ$ Angles on Line = 180°
 $FG \parallel HI$ Alternate Interior Angles
 are equal so lines must
 be parallel.

17. Each interior angle of a regular polygon is eight times as large as its corresponding exterior angle. How many sides does the polygon have? Explain your answer

Interior Angles
 are 8 times
 the Exterior
 Angles



$$8x + x = 180^\circ \quad (\text{Supplementary Angles})$$

$$\frac{9x}{9} = \frac{180}{9}$$

$$x = 20^\circ$$

Each exterior angle is 20°

For any polygon the exterior angles add to 360°

In a regular polygon all the exterior angles are the same.

There are n angles and each one measures 20°

$$\text{So } \frac{n \times 20}{20} = \frac{360}{20}$$

$$n = 18$$

This polygon has
 18 sides