

Geometry A

3.1 Parallel Lines and Transversals

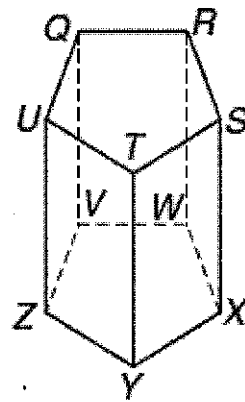
Name Key
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ASSIGNMENT

In #1-3, write the geometrical term that matches each definition.

- Two planes that do not intersect Parallel planes
- Two coplanar lines that do not intersect Parallel lines
- A line that intersects two or more lines in a plane transversal

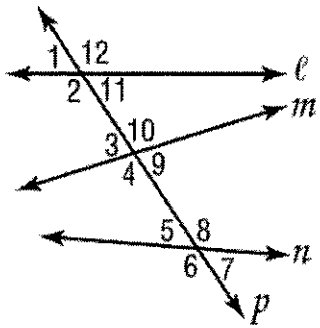
For #4-8 refer to the figure at the right.



- Name all segments that intersect \overline{QU} . \overline{QR} \overline{QV} \overline{TU} \overline{ZU}
- Name all segments that are parallel to \overline{YX} . \overline{TS}
- Name all the planes that intersect plane STX .
Planes XWV , ZYT , SRW and TSR
- Name all the planes that are parallel to plane QRT .
Plane WXY
- Which segment is parallel to \overline{QR} ?
 A. \overline{QU} B. \overline{VW} C. \overline{RW} D. \overline{SX}

For #9 -16 refer to the figure at the right. Give the name of each special angle pair.

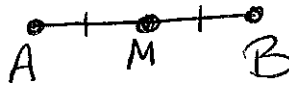
- $\angle 3$ and $\angle 5$ Corresponding
- $\angle 6$ and $\angle 12$ Alt. Ext. Angles
- $\angle 4$ and $\angle 8$ Alt. Int Angles
- $\angle 2$ and $\angle 3$ Consec Int Angles
- $\angle 8$ and $\angle 12$ Corresp
- $\angle 5$ and $\angle 9$ Alt Int Angles
- $\angle 4$ and $\angle 10$ Vertical Angles
- $\angle 6$ and $\angle 7$ Linear Pair



Review:

17. Suppose M is the midpoint of AB . What conjecture(s) can you make from this information? (Choose all correct answers).

- A. $AM + AB = MB$
B. $AB = 2(AM)$
C. $AM = MB$
D. $AB = MB$



State the property, definition, theorem, or postulate that justifies each statement.

18. $CD = CD$. Reflexive
19. If $\overline{AB} \cong \overline{BC}$ and $\overline{BC} \cong \overline{CE}$, then $\overline{AB} \cong \overline{CE}$. Transitive
20. If N is between M and P , then $MN + NP = MP$. Segment Addition
21. If $EF + GH = 14$ and $GH = 8$, then $EF + 8 = 14$. Substitution
22. If $\overline{MN} \cong \overline{PQ}$, then $\overline{PQ} \cong \overline{MN}$. Symmetric
23. If $m\angle 7 + m\angle 8 = 85^\circ$ and $m\angle 8 = 41^\circ$, then $m\angle 7 + 41^\circ = 85^\circ$. Substitution
24. If R is the midpoint of \overline{QT} , then $\overline{QR} \cong \overline{RT}$. def of a midpoint

Geometry A
3.2 Angles and Parallel Lines

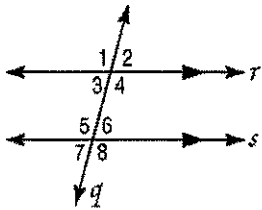
Name _____
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ASSIGNMENT

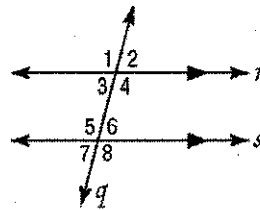
Find x and the measure of each indicated angle.

1. $m\angle 1 = 7x - 28$, $m\angle 8 = 5x + 12$

2. $m\angle 3 = 4x + 30$, $m\angle 7 = 3x + 52$



$$\begin{aligned} 7x - 28 &= 5x + 12 \\ 2x &= 40 \\ x &= 20 \end{aligned}$$



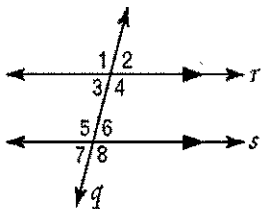
$$\begin{aligned} 4x + 30 &= 3x + 52 \\ x &= 22 \end{aligned}$$

$x = \underline{20}$, $m\angle 1 = \underline{112}$, $m\angle 3 = \underline{68}$

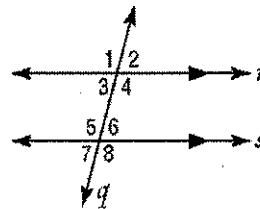
$x = \underline{22}$, $m\angle 3 = \underline{118}$, $m\angle 5 = \underline{62}$

3. $m\angle 4 = 2x + 30$, $m\angle 6 = 3x + 15$

4. $m\angle 5 = 6x + 12$, $m\angle 8 = 7x - 9$



$$\begin{aligned} 2x + 30 + 3x + 15 &= 180 \\ 5x + 45 &= 180 \\ 5x &= 135 \\ x &= 27 \end{aligned}$$



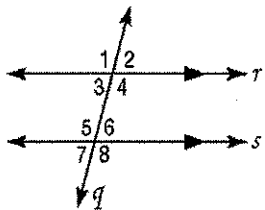
$$\begin{aligned} 6x + 12 &= 7x - 9 \\ 21 &= x \end{aligned}$$

$x = \underline{27}$, $m\angle 4 = \underline{84}$, $m\angle 2 = \underline{96}$

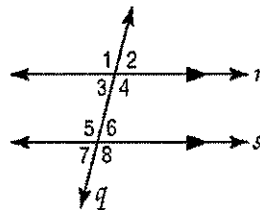
$x = \underline{21}$, $m\angle 8 = \underline{138}$, $m\angle 4 = \underline{138}$

5. $m\angle 2 = 4x - 10$, $m\angle 4 = x + 50$

6. $m\angle 4 = 10x - 21$, $m\angle 5 = 7x + 15$



$$\begin{aligned} 4x - 10 + x + 50 &= 180 \\ 5x + 40 &= 180 \\ 5x &= 140 \\ x &= 28 \end{aligned}$$



$$\begin{aligned} 10x - 21 &= 7x + 15 \\ 3x &= 36 \\ x &= 12 \end{aligned}$$

$x = \underline{28}$, $m\angle 2 = \underline{102}$, $m\angle 7 = \underline{102}$

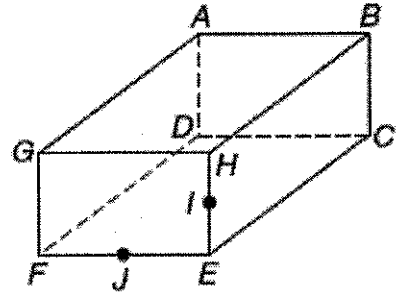
$x = \underline{12}$, $m\angle 5 = \underline{99}$, $m\angle 3 = \underline{81}$

Review:

Refer to the figure at the right.

7. Name 3 collinear points. ex) F, J, E

8. Name a point coplanar with A, G, and F. D

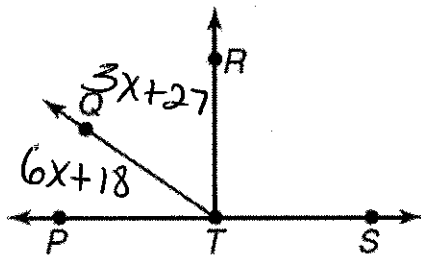


9. Find the distance between $J(-4, 7)$ and $K(3, -1)$.

$$\sqrt{(-4-3)^2 + (7-(-1))^2}$$

$$\sqrt{49 + 64} \quad \sqrt{113} \approx 10.6$$

10. If $m\angle PTQ = 6x + 18$, and $m\angle QTR = 3x + 27$ find the value of x so that $\overline{TR} \perp \overline{TS}$



$$6x + 18 + 3x + 27 = 90$$

$$9x + 45 = 90$$

$$9x = 45$$

$$x = 5$$

Geometry A
3.3 Slopes of Lines

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ASSIGNMENT

Determine whether \overline{KM} and \overline{ST} are parallel, perpendicular, or neither. Show work!

1. K(-4, 10), M(2, -8), S(1, 2), T(4, -7)

$$KM \frac{10 - (-8)}{-4 - 2} = \frac{18}{-6} = -3$$

$$ST \frac{2 - (-7)}{1 - 4} = \frac{9}{-3} = -3$$

Parallel

2. K(-4, 10), M(2, -8), S(1, 1), T(3, 7)

$$KM \frac{10 - (-8)}{-4 - 2} = \frac{18}{-6} = -3$$

$$ST \frac{1 - 7}{1 - 3} = \frac{-6}{-2} = 3$$

Neither

3. K(-4, 10), M(2, -8), S(-2, 2), T(10, 6)

$$KM \frac{10 - (-8)}{-4 - 2} = \frac{18}{-6} = -3$$

$$ST \frac{2 - 6}{-2 - 10} = \frac{-4}{-12} = \frac{1}{3}$$

Perpendicular

Suppose \overline{AB} has a slope = $\frac{2}{5}$, \overline{CD} has a slope = $\frac{5}{2}$, \overline{EF} has a slope = $-\frac{5}{2}$, \overline{GH} has a slope = $\frac{10}{4}$,
and \overline{JK} has a slope = $-\frac{2}{5}$.

4. Which two lines are parallel?

A. \overline{AB} and \overline{CD} B. \overline{CD} and \overline{GH} C. \overline{AB} and \overline{EF} D. \overline{AB} and \overline{JK}

5. Which two lines are perpendicular?

A. \overline{AB} and \overline{CD} B. \overline{CD} and \overline{GH} C. \overline{AB} and \overline{EF} D. \overline{AB} and \overline{JK}

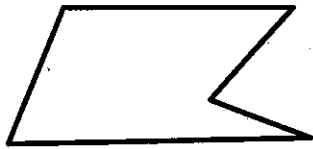
6. Which two lines are neither parallel nor perpendicular?

A. \overline{AB} and \overline{CD} B. \overline{CD} and \overline{GH} C. \overline{AB} and \overline{EF} D. \overline{AB} and \overline{JK}

Review:

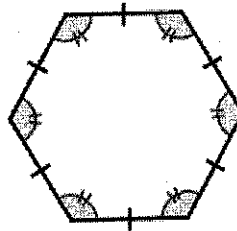
Name each polygon by its number of sides. Then classify each polygon as *convex* or *concave*, and as *regular* or *irregular*.

7.



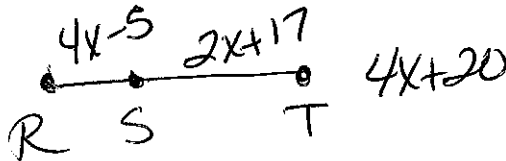
pentagon
concave
irregular

8.



hexagon
convex
regular

9. Find the value of x if S is between R and T , given that $RS = 4x - 5$, $ST = 2x + 17$, $RT = 4x + 20$.



$$4x - 5 + 2x + 17 = 4x + 20$$

$$6x + 12 = 4x + 20$$

$$2x = 8$$

$$x = 4$$

10. Complete the proof.

Given: $3x - 7 = -52$

Prove: $x = -15$

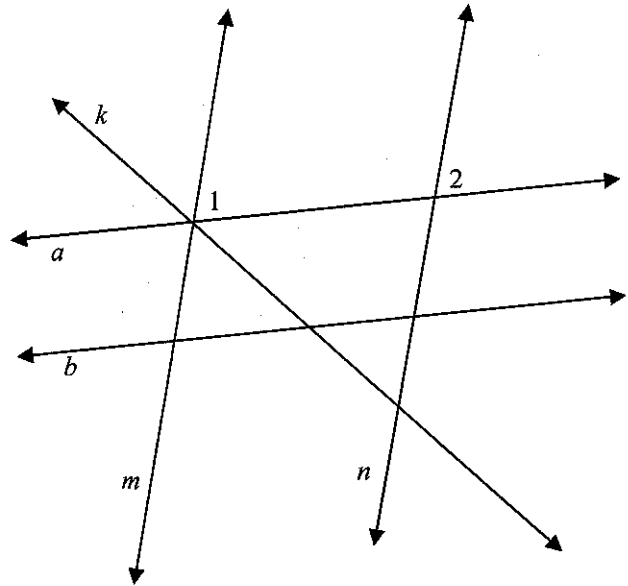
Statements	Reasons
1. $3x - 7 = -52$	1. Given
2. $3x - 7 + 7 = -52 + 7$	2. Add Prop
3. $3x = -45$	3. Subst.
4. $\frac{3x}{3} = \frac{-45}{3}$	4. Div. Prop
5. $x = -15$	5. Subst.

ASSIGNMENT

For # 1-6, consider the given information about each figure. Determine which lines, if any, are parallel and justify your answer. HINT: Remember to mark up the figure to help you identify the angle pair!

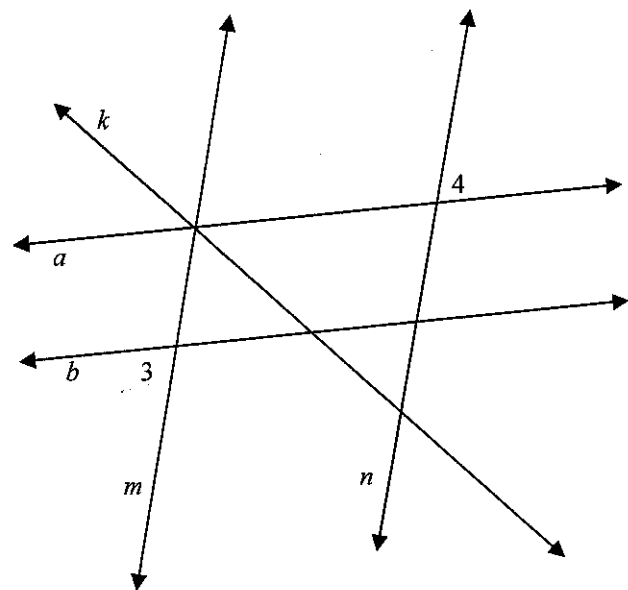
For # 1 and 2, suppose $\angle 1 \cong \angle 2$.

- Which lines are parallel?
 - $a \parallel b$
 - $m \parallel n$
 - There is not enough information.
- Select the correct justification.
 - $CA \cong \leftrightarrow \parallel$ lines
 - $AIA \cong \leftrightarrow \parallel$ lines
 - $AEA \cong \leftrightarrow \parallel$ lines
 - CIA supplementary $\leftrightarrow \parallel$ lines
 - There is not a common transversal



For # 3 and 4, suppose $\angle 3 \cong \angle 4$.

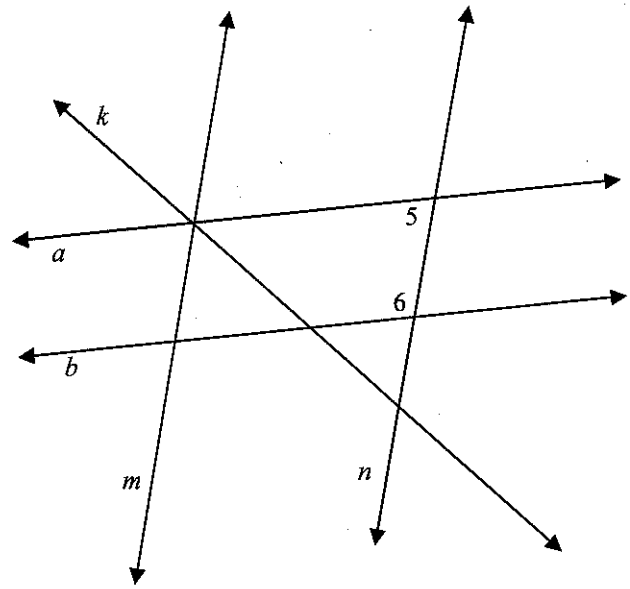
- Which lines are parallel?
 - $a \parallel b$
 - $m \parallel n$
 - There is not enough information.
- Select the correct justification.
 - $CA \cong \leftrightarrow \parallel$ lines
 - $AIA \cong \leftrightarrow \parallel$ lines
 - $AEA \cong \leftrightarrow \parallel$ lines
 - CIA supplementary $\leftrightarrow \parallel$ lines
 - There is not a common transversal



For # 5 and 6, suppose $m\angle 5 + m\angle 6 = 180$.

5. Which lines are parallel?
 A. $a \parallel b$
 B. $m \parallel n$
 C. There is not enough information.

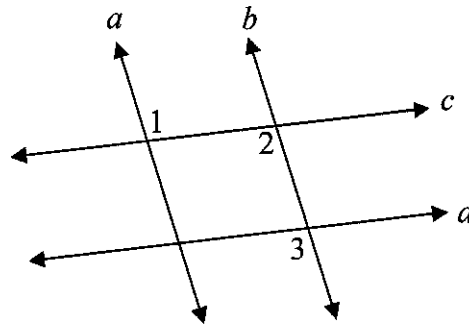
6. Select the correct justification.
 A. CA $\cong \leftrightarrow \parallel$ lines
 B. AIA $\cong \leftrightarrow \parallel$ lines
 C. AEA $\cong \leftrightarrow \parallel$ lines
 F. CIA supplementary $\leftrightarrow \parallel$ lines
 E. There is not a common transversal



7. Complete the following proof.

Given: $\angle 1 \cong \angle 3$
 $a \parallel b$

Prove: $c \parallel d$



Statements	Reasons
1. $\angle 1 \cong \angle 3$	1. Given
2. $a \parallel b$	2. Given
3. $\angle 1 \cong \angle 2$	3. AIA $\cong \leftrightarrow \parallel$ lines
4. $\angle 2 \cong \angle 3$	4. Substitution Property
5. $c \parallel d$	5. CA $\cong \leftrightarrow \parallel$ lines

Review:

8. Which one of the following pairs of slopes are slopes corresponding to parallel lines?

A. $\frac{5}{3}$ and $\frac{6}{10}$

B. $\frac{3}{5}$ and $\frac{9}{15}$

C. $-\frac{10}{6}$ and $\frac{3}{5}$

D. $\frac{6}{10}$ and $-\frac{9}{15}$

9. Which one of the following pairs of slopes are slopes corresponding to perpendicular lines?

A. $\frac{5}{3}$ and $\frac{6}{10}$

B. $\frac{3}{5}$ and $\frac{9}{15}$

C. $-\frac{10}{6}$ and $\frac{3}{5}$

D. $\frac{6}{10}$ and $-\frac{9}{15}$

10. Which one of the following pairs of slopes are slopes corresponding to lines that are neither parallel nor perpendicular?

A. $\frac{4}{9}$ and $\frac{9}{4}$

B. $\frac{3}{2}$ and $\frac{15}{10}$

C. $-\frac{8}{5}$ and $\frac{15}{24}$

D. $-\frac{2}{7}$ and $-\frac{4}{14}$

11. Segment AB has endpoints $A(-2, 3)$ and $B(5, 0)$.

a. Find the midpoint. $(1.5, 1.5)$

$$\left(\frac{-2+5}{2}, \frac{3+0}{2} \right)$$

b. In what quadrant does the midpoint lie?

I

$$\left(\frac{3}{2}, \frac{3}{2} \right)$$

12. Suppose $\angle 1$ and $\angle 2$ are vertical angles. If $m\angle 1 = 9b + 3$ and $m\angle 2 = 5b + 31$, find $m\angle 2$.

$$9b + 3 = 5b + 31$$

$$4b = 28$$

$$b = 7$$

$$5(7) + 31 =$$

$$35 + 31 = 66$$

