Chapter 3 Study Guide-R

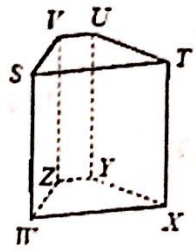
(Parallel and Perpendicular Lines)

Name Key

Date _____ Period _____

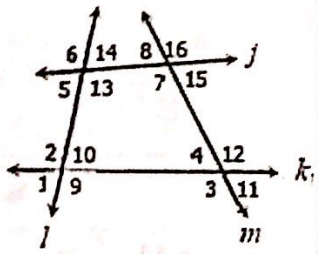
Topic 1: parallel Lines & Planes

Use the diagram to the right for questions 1-5.



1. Name a plane parallel to plane WXT. VUY
2. Name two segments parallel to $\overline{VU}$. $\overline{ZY}$, $\overline{WX}$, $\overline{ST}$
3. Name two segments parallel to $\overline{SW}$. $\overline{VZ}$, $\overline{UY}$, $\overline{TX}$
4. Name two segments skew to $\overline{XY}$. $\overline{SV}$, $\overline{VU}$, $\overline{ST}$, $\overline{VZ}$, $\overline{SW}$
5. Name two segments skew to $\overline{VZ}$. $\overline{UT}$, $\overline{YX}$, $\overline{ST}$, $\overline{WX}$

Name each angle pair as corresponding, alternate interior, alternate exterior, same side interior, or no relationship. Identify the transversal that connects each angle pair.

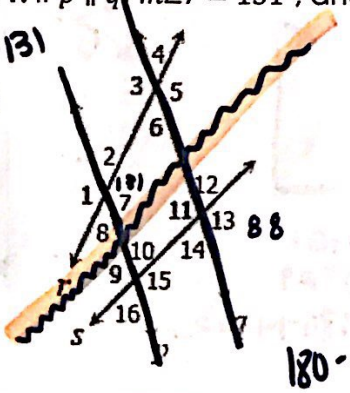


6. $\angle 4$ and $\angle 10$ SSI ; Transversal: line k
7. $\angle 8$ and $\angle 11$ alt. ext ; Transversal: line m
8. $\angle 2$ and $\angle 12$ none (same side ext) ; Transversal: line k
9. $\angle 5$ and $\angle 7$ Corresponding ; Transversal: line j
10. $\angle 2$ and $\angle 13$ alt. int ; Transversal: line l

Topic 2: Parallel Lines & Angles

11. If $p \parallel q$, $m\angle 7 = 131°$, and $m\angle 13 = 88°$, find the measure of each missing angle.

180-131 = 49

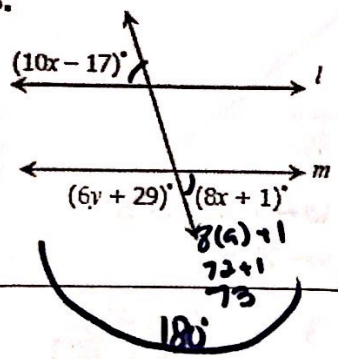


180-88=92

a. $m\angle 1 =$ 131°	b. $m\angle 6 =$ 49°	c. $m\angle 12 =$ 92°
d. $m\angle 2 =$ 49°	e. $m\angle 8 =$ 49°	f. $m\angle 14 =$ 92°
g. $m\angle 3 =$ 131°	h. $m\angle 9 =$ 88°	i. $m\angle 15 =$ 88°
j. $m\angle 4 =$ 49°	k. $m\angle 10 =$ 92°	l. $m\angle 16 =$ 92°
m. $m\angle 5 =$ 131°	n. $m\angle 11 =$ 88°	

For questions 12-14, find the value of x and y if $l \parallel m$.

12.



$10x - 17 = 8x + 1$

$-8x \quad -8x$

$2x - 17 = 1$

$+17 \quad +17$

$\frac{2x}{2} = \frac{18}{2}$

$x = 9$

$6y + 29 + 73 = 180$

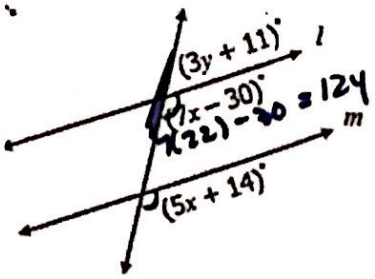
$6y + 102 = 180$

$-102 \quad -102$

$\frac{6y}{6} = \frac{78}{6}$

$y = 13$

13.



$7x - 30 = 5x + 14$

$+30 \quad +30$

$7x = 5x + 44$

$-5x \quad -5x$

$2x = 44$

$\frac{2x}{2} = \frac{44}{2}$

$\boxed{x = 22}$

$3y + 11 + 124 = 180$

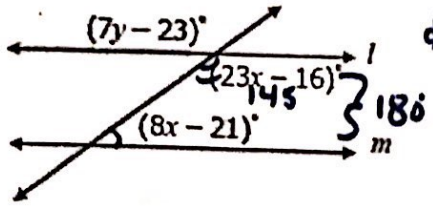
$3y + 135 = 180$

$-135 \quad -135$

$\frac{3y}{3} = \frac{45}{3}$

$\boxed{y = 15}$

14.



$23(7) - 16$

$23x - 16 + 8x - 21 = 180$

$31x - 37 = 180$

$+37 \quad +37$

$31x = 217$

$\boxed{x = 7}$

$7y - 23 = 145$

$+23 \quad +23$

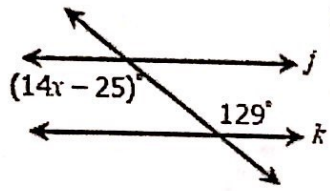
$7y = 168$

$\boxed{y = 24}$

Topic 3: Proving Lines Are Parallel

For questions 17-18, find the value of x that would prove $j \parallel k$. State the converse that justifies your answer.

15.



$14x - 25 = 129$

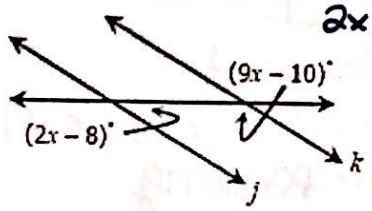
$+25 \quad +25$

$\frac{14x}{14} = \frac{154}{14}$

$x = 11$

Converse Alt. Int. Converse

16.



$2x - 8 + 9x - 10 = 180$

$11x - 18 = 180$

$+18 \quad +18$

$11x = 198$

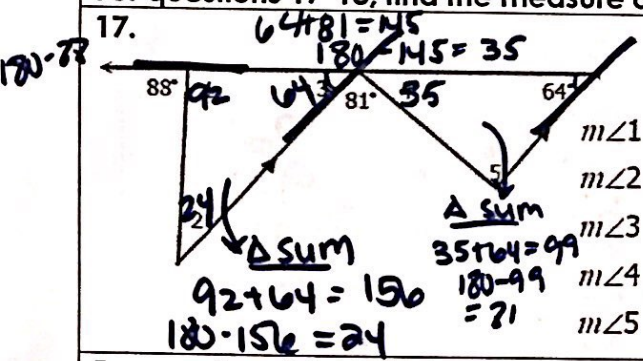
$x = 18$

Converse SSI Converse

Topic 4: Angles of Triangles

For questions 17-18, find the measure of each missing angle.

17.



$64 + 81 = 145$

$180 - 145 = 35$

$180 - 88$

$m\angle 1 = 92°$

$m\angle 2 = 24°$

$m\angle 3 = 64°$

$m\angle 4 = 35°$

$m\angle 5 = 81°$

Δ sum

$92 + 64 = 156$

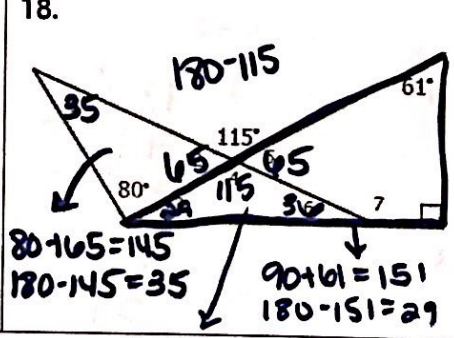
$180 - 156 = 24$

Δ sum

$35 + 64 = 99$

$180 - 99 = 81$

18.



$180 - 115$

$m\angle 1 = 35°$

$m\angle 2 = 66°$

$m\angle 3 = 29°$

$m\angle 4 = 115°$

$m\angle 5 = 65°$

$m\angle 6 = 36$

$m\angle 7 = 144°$

$80 + 65 = 145$

$180 - 145 = 35$

$90 + 61 = 151$

$180 - 151 = 29$

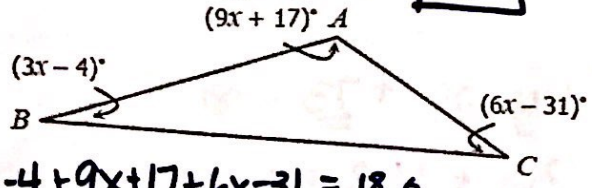
$115 + 29 = 144$

$180 - 144 = 36$

$180 - 36$

For questions 19-20, find the $m\angle A$.

19.



$9(11) + 17 = \boxed{116°}$

$3x - 4 + 9x + 17 + 6x - 31 = 180$

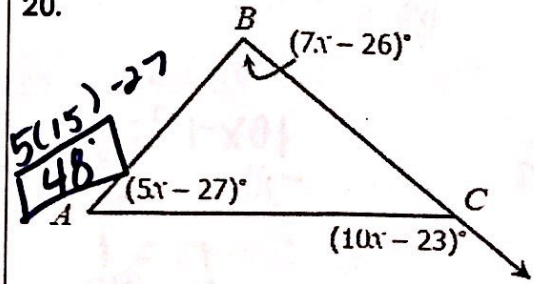
$18x - 18 = 180$

$+18 \quad +18$

$18x = 198$

$x = 11$

20.



$5x - 27 + 7x - 26 = 10x - 23$

$12x - 53 = 10x - 23$

$-10x \quad -10x$

$2x - 53 = -23$

$+53 \quad +53$

$2x = 30$

$x = 15$

Topic 5: Parallel and Perpendicular Lines

For questions 21-23, determine if AB and CD are parallel, perpendicular, or neither.

21. $A(-11, 5)$, $B(-8, 4)$, $C(8, -7)$, $D(-1, -4)$

$\frac{4-5}{-8-(-11)} = \frac{-1}{3}$ $\quad \frac{-4-(-7)}{-1-8} = \frac{3}{-9} = -\frac{1}{3}$

Slope of $\overleftrightarrow{AB}$	Slope of $\overleftrightarrow{CD}$	Types of Lines
$-1/3$	$-1/3$	parallel

22. $A(-3, 8)$, $B(1, 15)$, $C(10, -9)$, $D(3, -5)$

$\frac{15-8}{1-(-3)} = \frac{7}{4}$ $\quad \frac{-5-(-9)}{3-10} = \frac{4}{-7}$

Slope of $\overleftrightarrow{AB}$	Slope of $\overleftrightarrow{CD}$	Types of Lines
$7/4$	$-4/7$	perpendicular

23. $A(9, -3)$, $B(9, 4)$, $C(-2, 10)$, $D(-2, 6)$

$\frac{4-(-3)}{9-9} = \frac{7}{0}$ $\quad \frac{6-10}{-2-(-2)} = \frac{-4}{0}$

Slope of $\overleftrightarrow{AB}$	Slope of $\overleftrightarrow{CD}$	Types of Lines
undef.	undef.	parallel

For questions 24-25, determine if the lines are parallel, perpendicular, or neither.

24. $6x + 10y = 20$ and $5x - 3y = 21$

$\frac{10y}{10} = \frac{-6x}{10} + \frac{20}{10}$ $\quad \frac{-3y}{-3} = \frac{-5x}{-3} + \frac{21}{-3}$

$y = -\frac{3}{5}x + 2$ $\quad y = \frac{5}{3}x - 7$

$m = -3/5$ $\quad m = 5/3$

perpendicular

25. $x - y = 4$ and $x + y = 9$

$\frac{-y}{-1} = \frac{-x}{-1} + \frac{4}{-1}$ $\quad y = -x + 9$

$y = x - 4$

$m = 1$ $\quad m = -1$

perpendicular