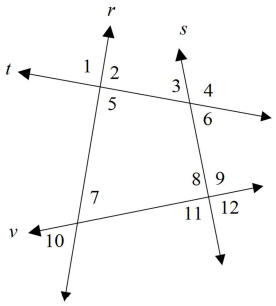
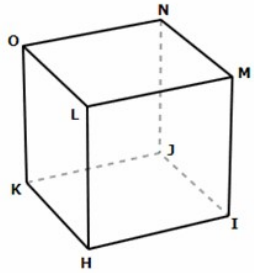
Formal Geometry **2.7 Worksheet** **Do this assignment on your own paper!**

For #1 – 6, identify the transversal connecting each pair of angles. Then classify the relationship between each pair of angles as alternate interior, alternate exterior, corresponding, or consecutive interior angles.

1) $\angle 5$ and $\angle 7$
2) $\angle 10$ and $\angle 11$
3) $\angle 6$ and $\angle 8$
4) $\angle 9$ and $\angle 10$
5) $\angle 11$ and $\angle 7$
6) $\angle 5$ and $\angle 6$

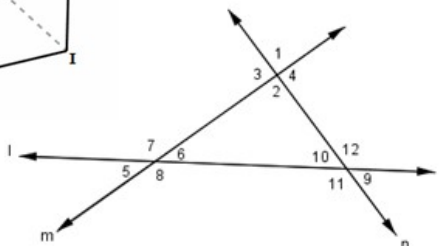




For #7 – 9, describe the relationship between each pair of segments as parallel, skew, or intersecting. Explain your decision.

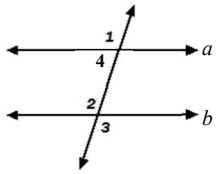
7) $\overline{OL}$ and $\overline{KJ}$
8) $\overline{NM}$ and $\overline{NJ}$
9) $\overline{MI}$ and $\overline{KO}$

10) Identify any angles that are alternate exterior with $\angle 1$ in the diagram to the right.

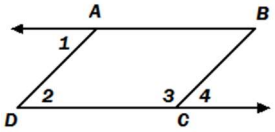


For #11 – 13, identify any pairs of congruent angles with the given parallel lines. Write the theorem(s) that supports your conclusion.

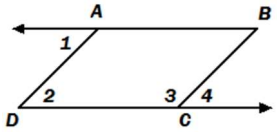
11) $a \parallel b$



12) $AB \parallel DC$

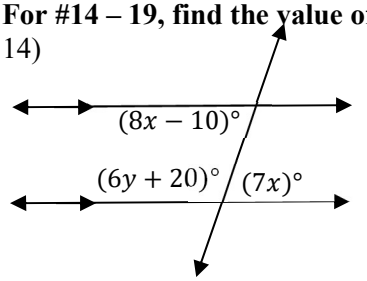


13) $AD \parallel BC$



For #14 – 19, find the value of the variable(s) in each problem.

14)



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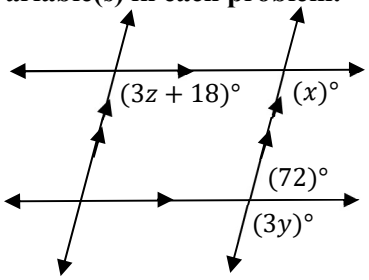

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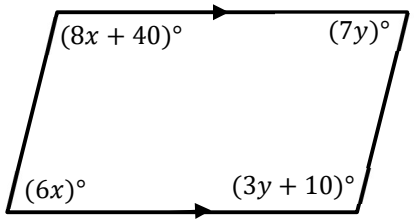
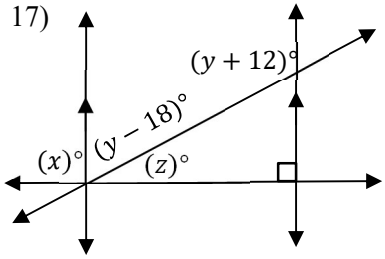
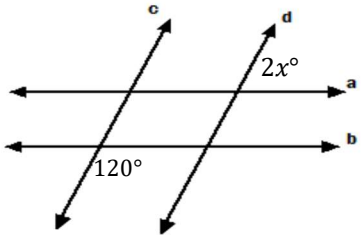


17)



18) Given $a \parallel b$ and $c \parallel d$, find x.



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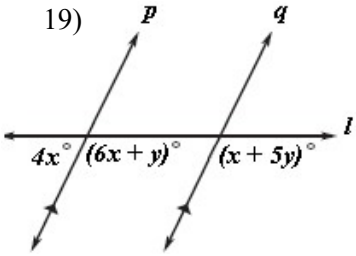
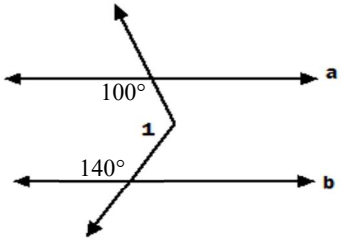


For #20 – 22, find $m\angle 1$ if $a \parallel b$.

20)



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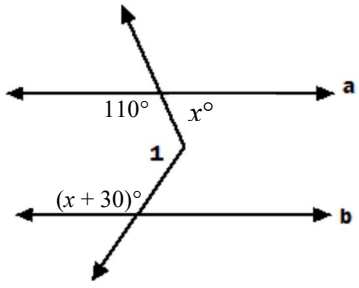

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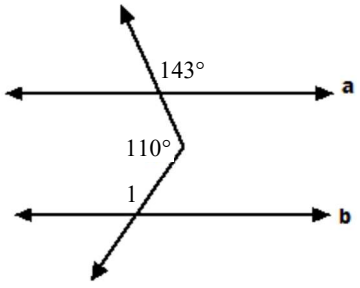
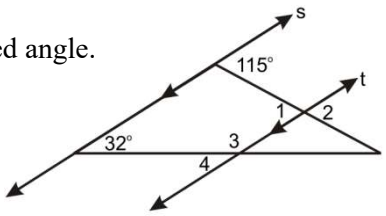


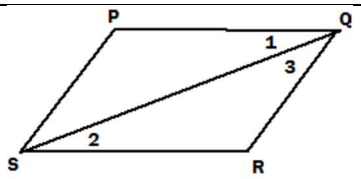
23) Use the diagram shown to find the measure of each numbered angle.



For #24 – 27, complete each proof.

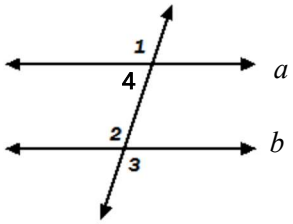
24) Given: $\overline{PQ} \parallel \overline{RS}$, $\angle 2 \cong \angle 3$

Prove: $\overline{QS}$ *bisects* $\angle PQR$



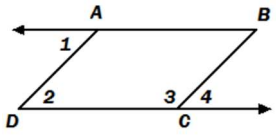
25) Given: $a \parallel b$

Prove: $\angle 3$ supp $\angle 4$



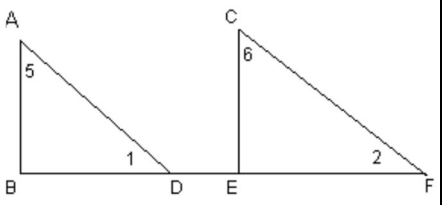
26) Given: $AD \parallel BC$; $\angle 1 \cong \angle 4$

Prove: $\angle 2 \cong \angle 1$

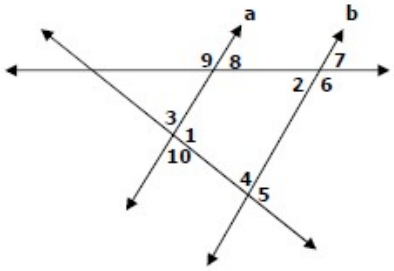


27) Given: $\angle 1$ comp $\angle 5$
$\angle 2$ comp $\angle 6$
$\overline{AD} \parallel \overline{CF}$

Prove: $\angle 5 \cong \angle 6$



28) Given that $a \parallel b$, $\angle 2 = 67°$, and $\angle 3 = 81°$, then find the measure of each numbered angle in the diagram shown.



For #29 – 31: Is the statement Sometimes, Always, or Never true?

29) If two lines don't intersect, then they are parallel.

30) If two lines are skew, then they are coplanar.

31) If two lines intersect, then they are coplanar.

Answers:

1) *r*; consec int angles 2) *v*; corresp angles 3) *s*; alt int angles 4) *v*; alt ext angles 5) *v*; alt int angles
6) *t*; corresp angles 7) skew: lines don't intersect and are in diff planes 8) intersect: lines cross at N
9) parallel; lines don't intersect but are in the same plane 10) $\angle 8$ and $\angle 11$
11) $\angle 1 \cong \angle 2$ (If //, then corresp $\angle$s $\cong$); $\angle 1 \cong \angle 3$ (If //, then alt ext $\angle$s $\cong$); $\angle 3 \cong \angle 2$ (If vert $\angle$s, then $\cong$)
12) $\angle 1 \cong \angle 2$ (If //, then alt int $\angle$s $\cong$) 13) $\angle 4 \cong \angle 2$ (If //, then corresp $\angle$s $\cong$) 14) $x = 10; y = 15$
15) $x = 108; y = 36; z = 30$ 16) $x = 10; y = 17$ 17) $x = 90, y = 93, z = 15$ 18) $x = 30$ 19) $x = 16; y = 20$
20) 120° 21) 150° 22) 107° 23) $m\angle 1 = m\angle 2 = 115; m\angle 3 = 148;\ m\angle 4 = 32$
Proofs will be graded in class; following is the fewest number of steps to solve the proofs. 24) proof; 4 steps
25) proof; 5 or 6 steps 26) Proof; 3 steps 27) proof; 3 steps
28) $m\angle 1 = m\angle 5 = 99;\ m\angle 7 = m\angle 8 = 67;\ m\angle 6 = m\angle 9 = 113;\ m\angle 4 = m\angle 10 = 81$
29) S 30) N 31) A