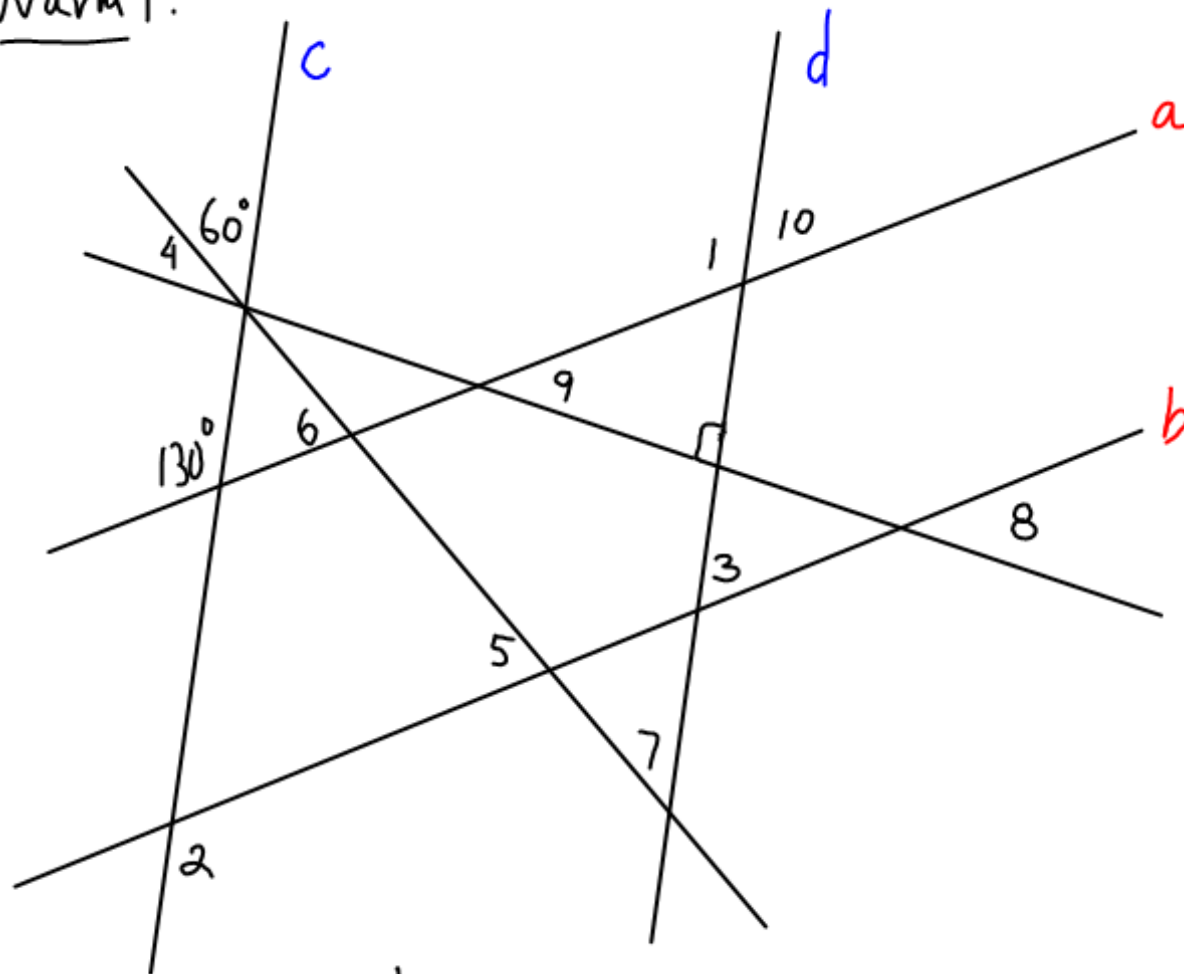


Warmup:

Try it!

Given: $a \parallel b$
 $c \parallel d$

Find the measure
of each numbered \angle .

$$m\angle 1 = 130^\circ$$

$$m\angle 2 = 130^\circ$$

$$m\angle 3 = 50^\circ$$

$$m\angle 4 = 30^\circ$$

$$m\angle 5 = 70^\circ$$

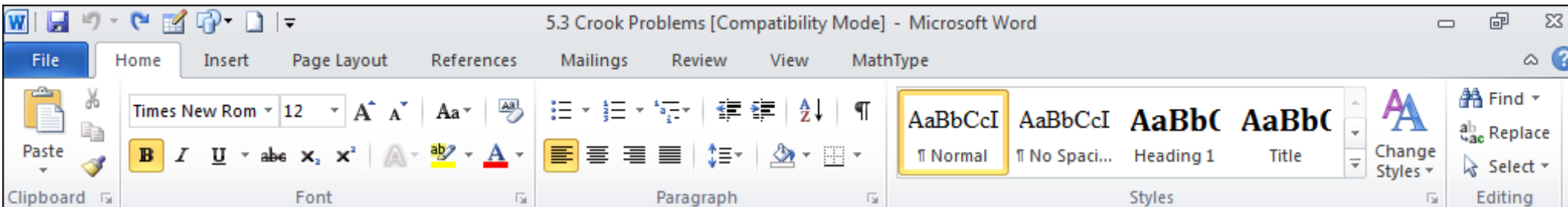
$$m\angle 6 = 70^\circ$$

$$m\angle 7 = 60^\circ$$

$$m\angle 8 = 40^\circ$$

$$m\angle 9 = 40^\circ$$

$$m\angle 10 = 50^\circ$$



5.3. Honors Geometry

DATE: 12/21

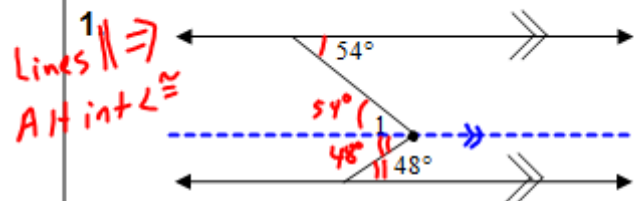
Target 4A. Understand and apply special angle relationships when parallel lines are cut by a transversal

Target 4B. Prove lines are parallel by using special angle relationships and relationships of \parallel and \perp lines

Crook Examples

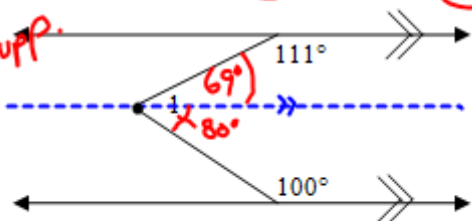
Find the $m\angle 1$.

$m\angle 1 = 54 + 48 = 102$

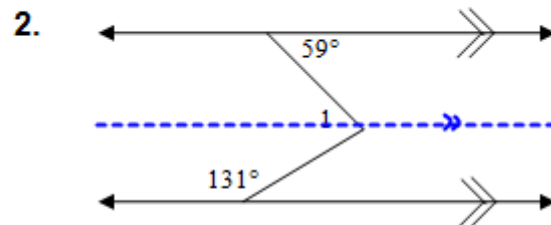


3. *Lines $\parallel \Rightarrow$
SSI \angle s supp.*

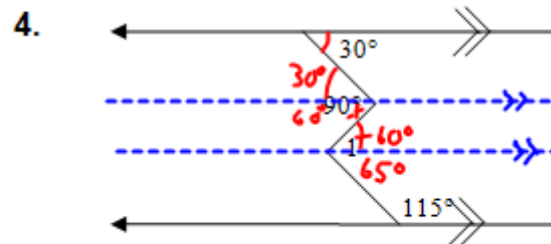
$m\angle 1 = 69 + 80 = 149$



5. Find x given r is parallel to q .

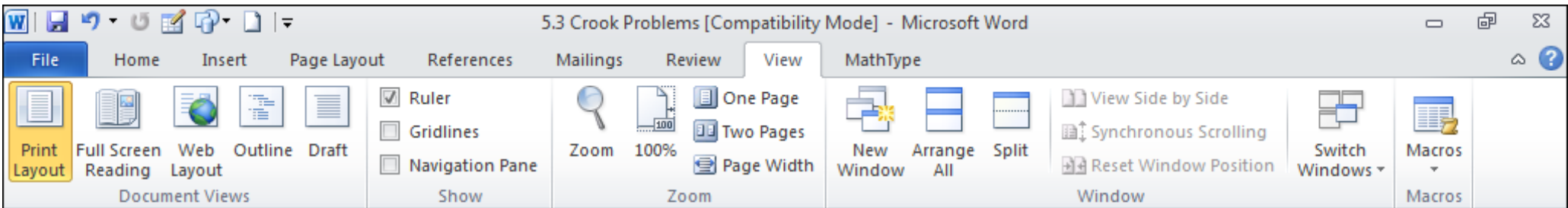


Try it!

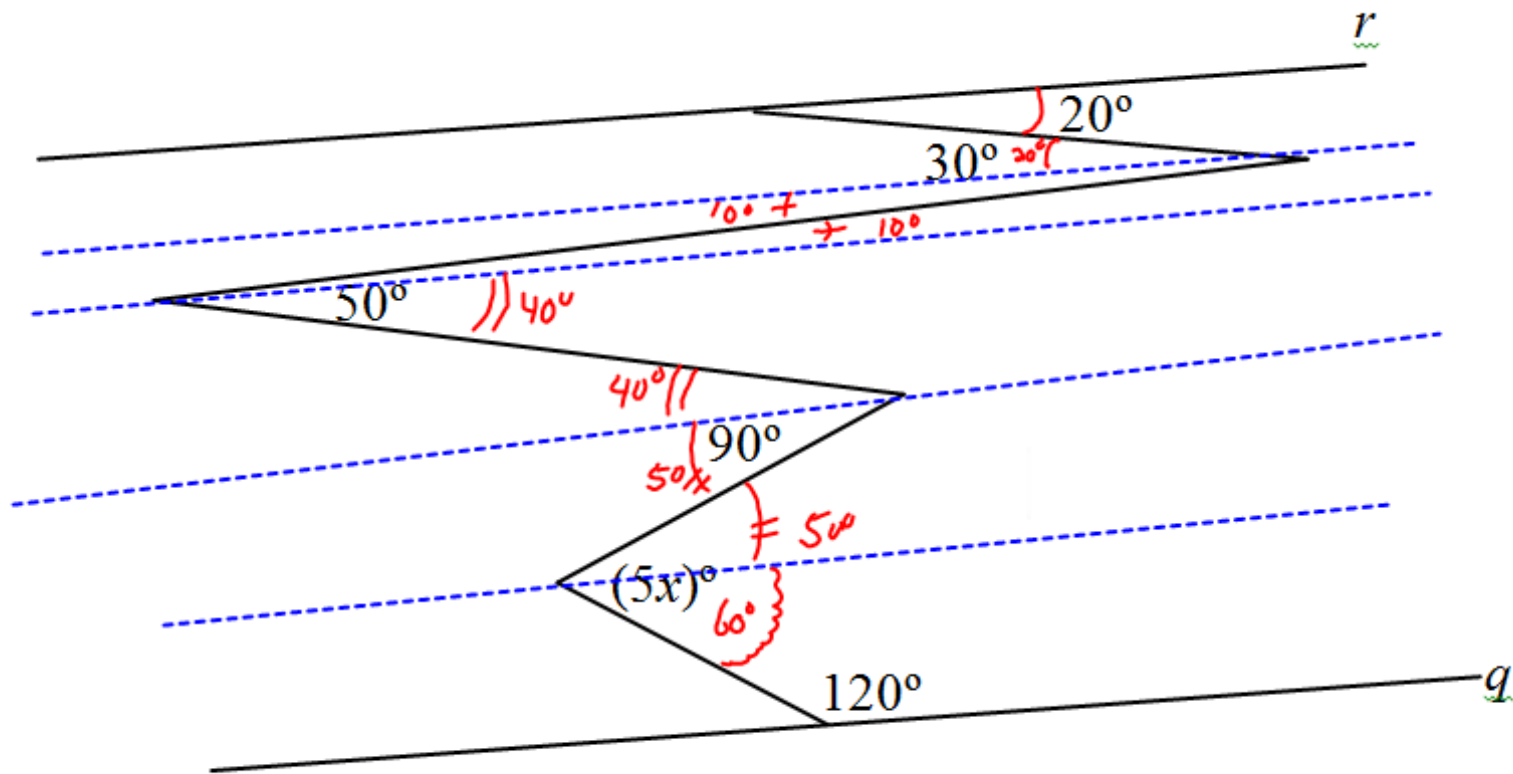


$90 - 30 = 60$

$m\angle 1 = 60 + 65 = 125$



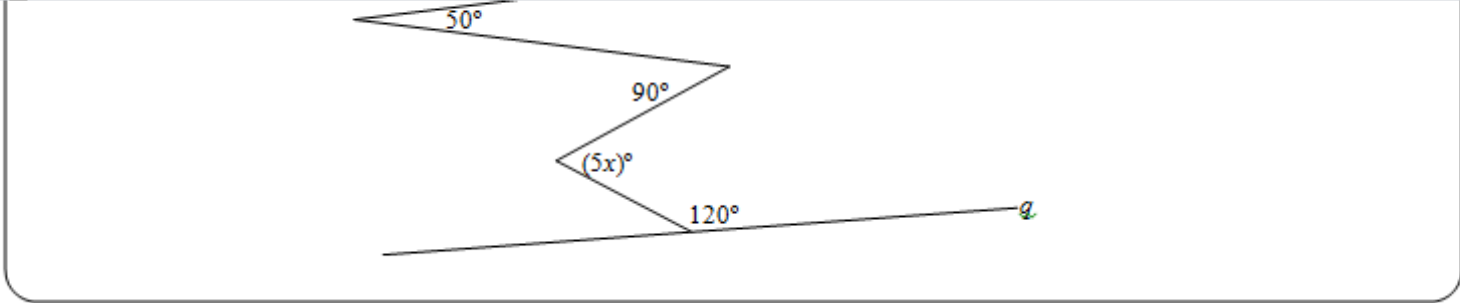
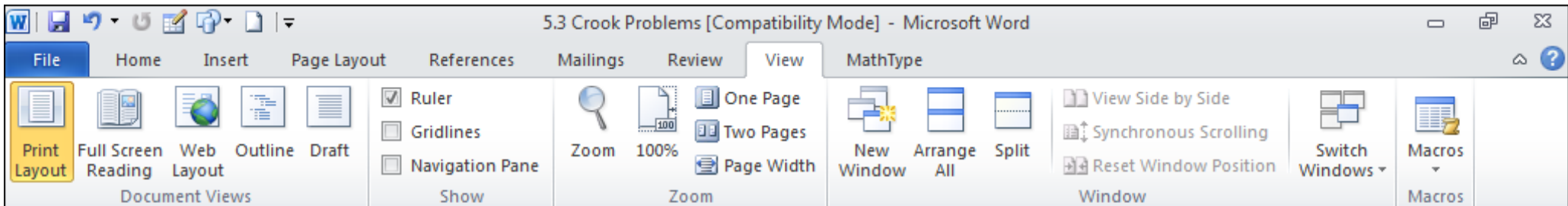
Find x given r is parallel to q .



$5x = 60 + 50$

$5x = 110$

$x = 22 \checkmark$

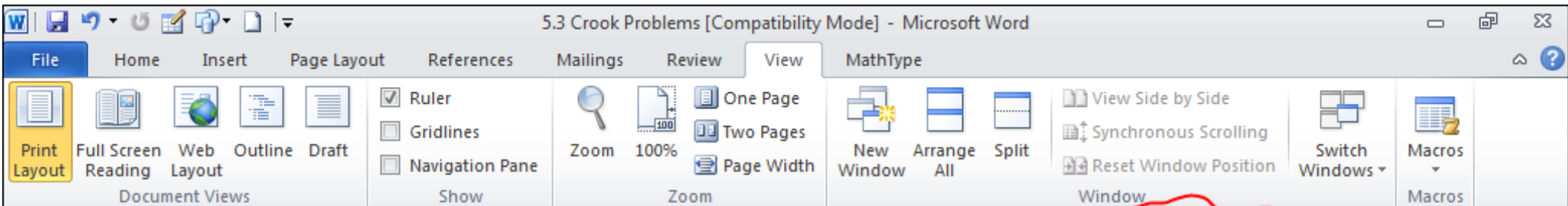


Find the measure of each numbered angle.

6. 7. *You try it!*

Find the measure of each numbered angle.

8. Given: $cl \parallel d$ 9.

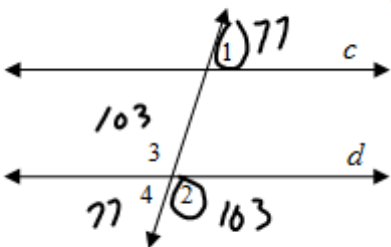


Find the measure of each numbered angle.

8. Given: $c \parallel d$

$$m\angle 1 = 2x + 15$$

$$m\angle 2 = 3x + 10$$



\parallel lines \Rightarrow
same-side Int
 \angle s supplementary.

$$2x + 15 + 3x + 10 = 180$$

$$5x + 25 = 180$$

$$5x = 155$$

$$\frac{5x}{5} = \frac{155}{5}$$

$$x = 31$$

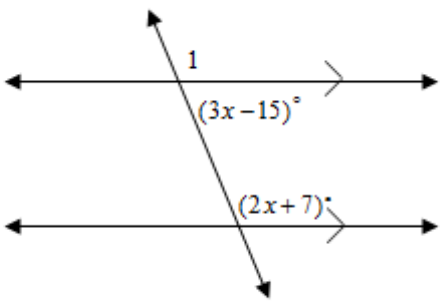
$$\angle 1 = 2(31) + 15$$

$$= 77 \checkmark$$

$$\angle 2 = 3(31) + 10$$

$$= 103 \checkmark$$

10.



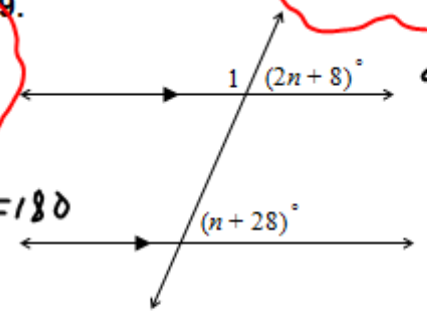
$$\angle 1 = 2(31) + 15$$

$$= 77 \checkmark$$

$$\angle 2 = 3(31) + 10$$

$$= 103 \checkmark$$

9.



\parallel lines \Rightarrow Corr. \angle s \cong

$$2n + 8 = n + 28$$

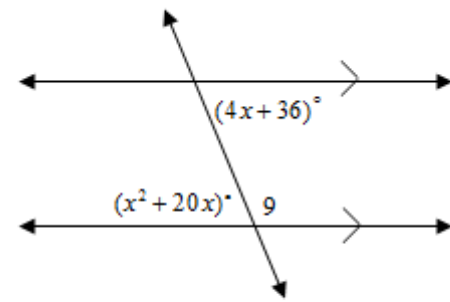
$$\begin{array}{r} -n & -n \\ \hline n + 8 = 28 \\ n = 20 \end{array}$$

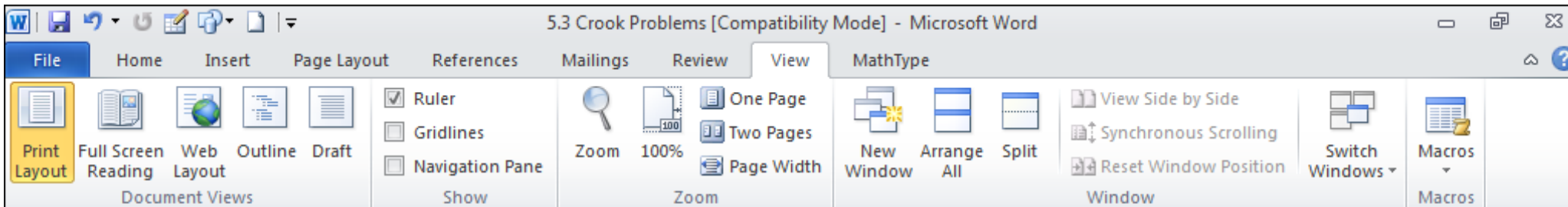
$$2(20) + 8 = 48$$

$$\angle 1 = 180 - 48$$

$$= 132 \checkmark$$

11.



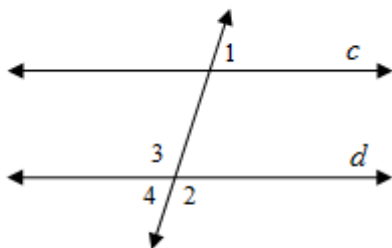


Find the measure of each numbered angle.

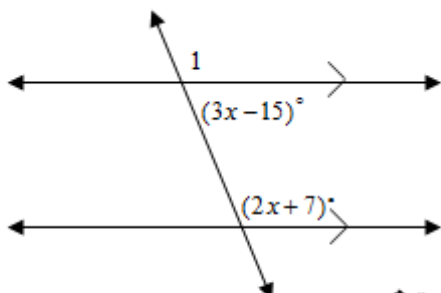
8. Given: $c \parallel d$

$$m\angle 1 = 2x + 15$$

$$m\angle 2 = 3x + 10$$



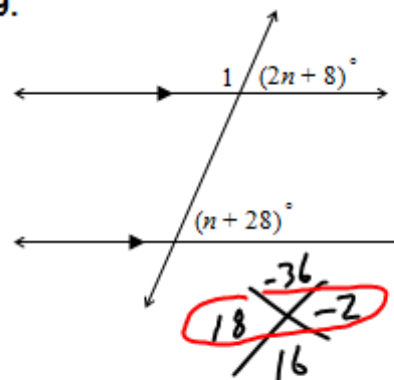
10.



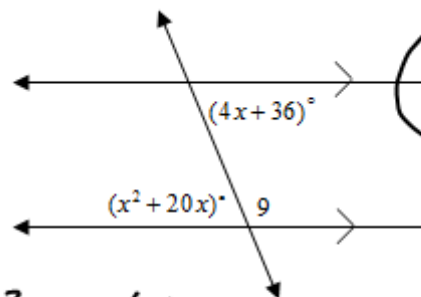
$$3x - 15 + 2x + 7 = 180$$

Finish it!

9.



11.



$$(2)^2 + 20(2)$$

$$4 + 40 = 44$$

$$\angle 9 = 180 - 44 = 136 \rightarrow \text{Final ans.}$$

|| Lines \Rightarrow

Alt. int. \angle s \cong

$$x^2 + 20x = 4x + 36$$

$$-4x - 36 \quad -4x - 36$$

$$x^2 + 16x - 36 = 0$$

$$(x + 18)(x - 2) = 0$$

$$x + 18 = 0 \text{ or } x - 2 = 0$$

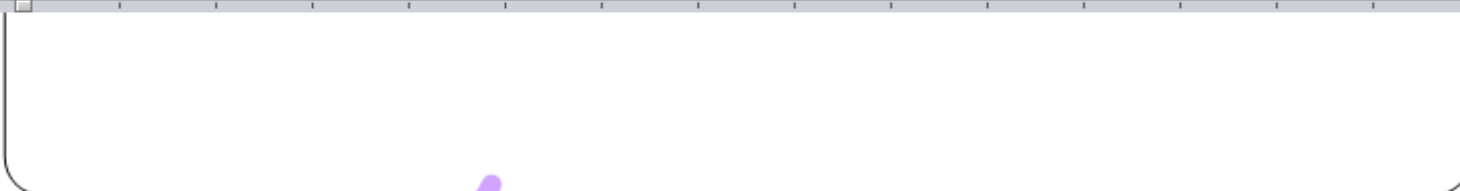
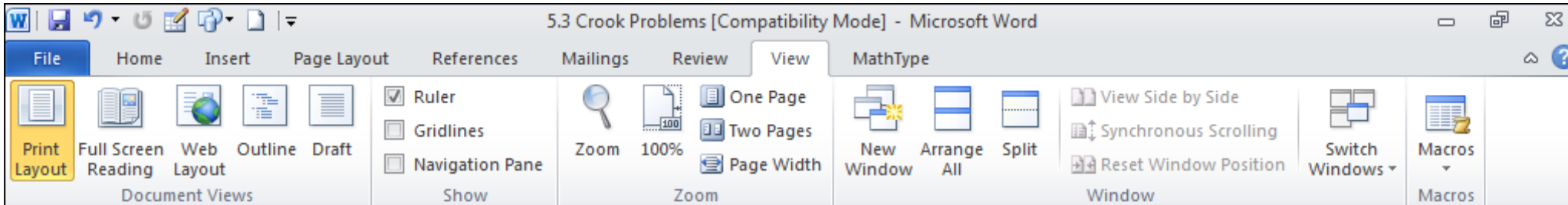
$$x = -18 \text{ or } x = 2$$

Plugging -18 into

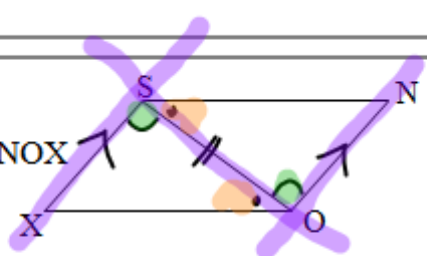
$4x + 36$ gives us -36.

This \angle can't be neg;

so $x = -18$ gets discarded.

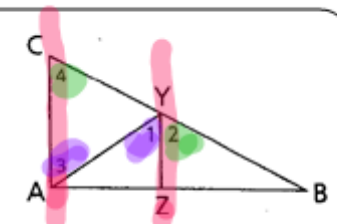


Given: $\overline{SX} \parallel \overline{NO}$
 $\angle NSX \cong \angle NOX$
 Prove: $\overline{SN} \parallel \overline{XO}$



statement	Reason
① $\overline{SX} \parallel \overline{NO}$ $\angle NSX \cong \angle NOX$	① Given
② $\angle XSO \cong \angle NOS$	② \parallel lines \Rightarrow alt. int. \angle s \cong
③ $\angle NSO \cong \angle XOS$	③ Sub. property of \angle s
④ $\overline{SN} \parallel \overline{XO}$	④ alt int \angle s $\cong \Rightarrow \parallel$ lines

Given: $\overline{CY} \cong \overline{AY}$
 $\overline{YZ} \parallel \overline{CA}$
 Prove: \overline{YZ} bis $\angle AYB$.



① $\overline{CY} \cong \overline{AY}$	① Given
② $\angle 4 \cong \angle 3$	② \parallel lines \Rightarrow alt. int. \angle s \cong
③ $\overline{YZ} \parallel \overline{CA}$	③ Given
④ $\angle 4 \cong \angle 2$	④ \parallel lines \Rightarrow corr \angle s \cong
⑤ $\angle 3 \cong \angle 2$	⑤ Transitive prop (step 2, 4)
⑥ $\angle 3 \cong \angle 1$	⑥ \parallel lines \Rightarrow alt int \angle s \cong
⑦ $\angle 1 \cong \angle 2$	⑦ Transitive prop (step 5, 6)
⑧ \overline{YZ} bis $\angle AYB$	⑧ Definition of bisector

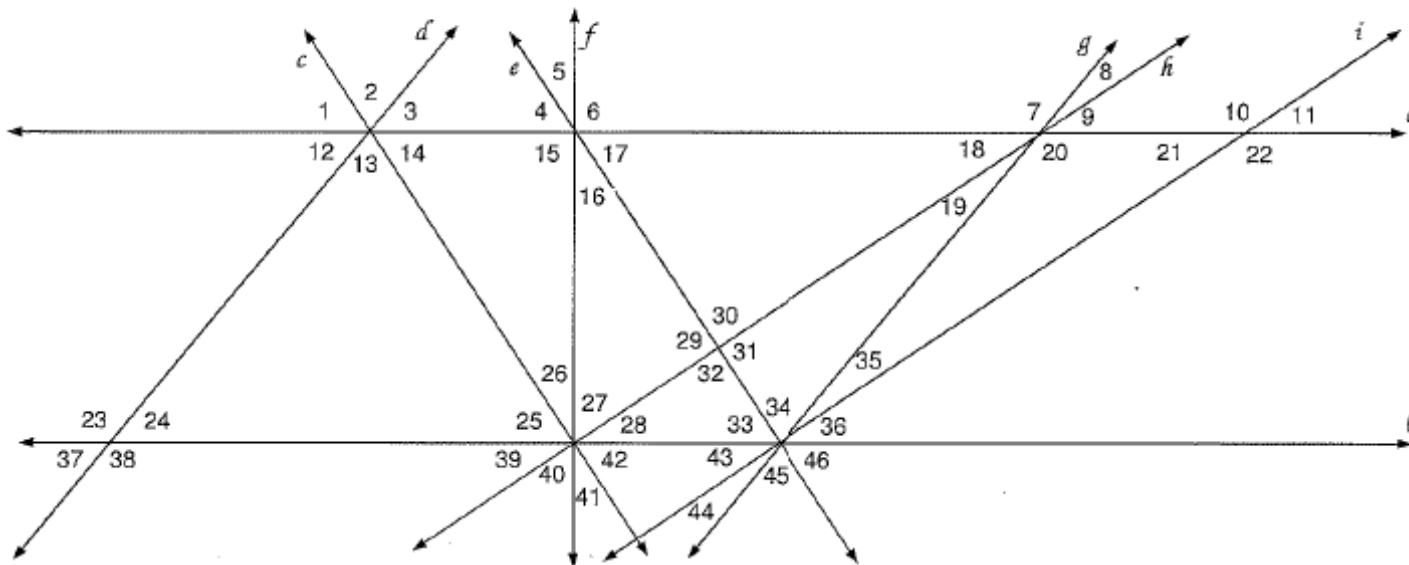
Have a safe break!

Geometry Honors Parallel Lines

Directions: Use the given information and your knowledge of parallel lines to find the measure of each angle in the figure. Give a rationale for how you determined each measure. When you are finished, copy the angle measures onto the final answer sheet.

Extra Credit!

Given: $a \parallel b$, $c \parallel e$, $d \parallel g$, $h \parallel i$, $f \perp a$, $c \perp h$, $m\angle 26 = 25$, and $m\angle 37 = 75$



Given: $a \parallel b$, $c \parallel e$, $d \parallel g$, $h \parallel i$, $f \perp a$, $c \perp h$, $m\angle 26 = 25$, and $m\angle 37 = 75$

Angle Measure	Rationale
$m\angle 26 = 25$	given
$m\angle 37 = 75$	given
$m\angle 24 = 75$	$\angle 24$ and $\angle 37$ are vertical angles
$m\angle 3 = 75$	$\angle 24$ and $\angle 3$ are corresponding angles.

Angle Measure	Rationale