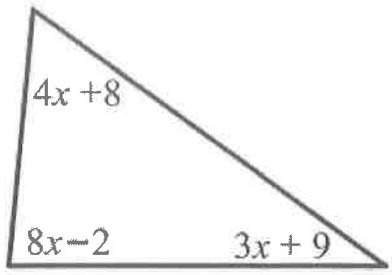
Math 1 Name Key

6-4 – 6-5 Triangle and Parallel Lines Proofs Date

In problems 1 – 5, use the properties of triangles you studied to answer the given questions.

1. Solve for x.



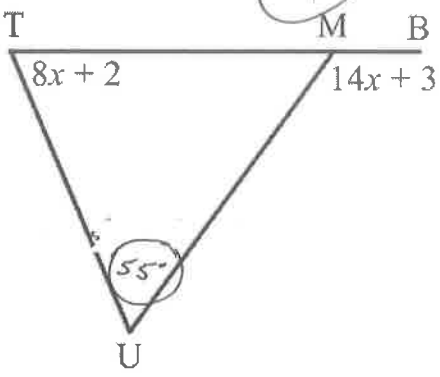
$4x+8+8x-2+3x+9=180$

$15x+15=180$

$\frac{15x}{15}=\frac{165}{15}$

$x=11$

2. Find the $m\angle BTU$ $74°$



$8x+2+55=14x+3$

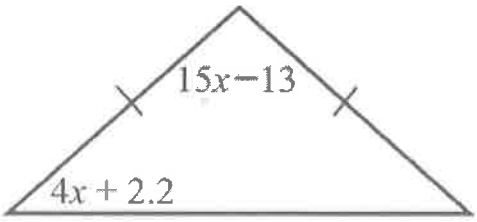
$8x+57=14x+3$

$54=6x$

$9=x$

$m\angle BTU = 8(9)+2 = 74°$

3. Solve for x.



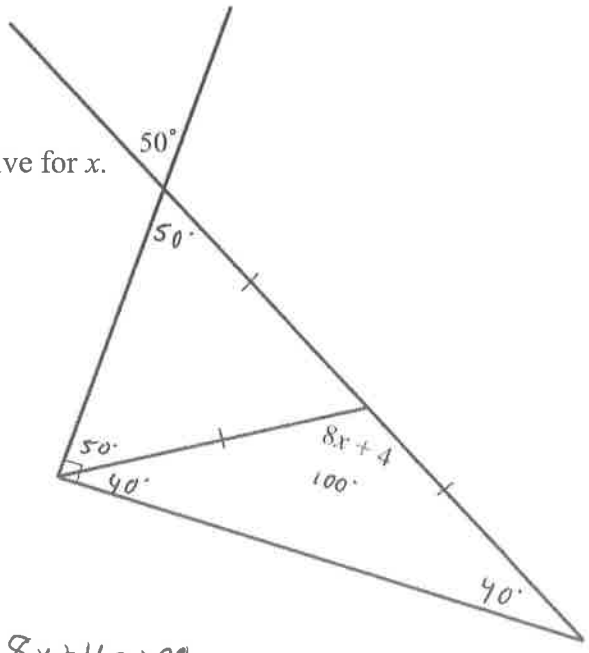
$15x-13+4x+2.2+4x+2.2=180$

$23x-8.6=180$

$\frac{23x}{23}=\frac{188.6}{23}$

$x=8.2$

4. Solve for x.



$8x+4=100$

$8x=96$

$x=12$

5. Could you draw a triangle with side lengths of 22, 28, 50? Explain how you know.

No, smaller two sides must add to be more than the third side.

6. Could you draw a triangle with side lengths of 20, 28, 15? Explain how you know.

yes since the smaller two sides add to more than the third side.

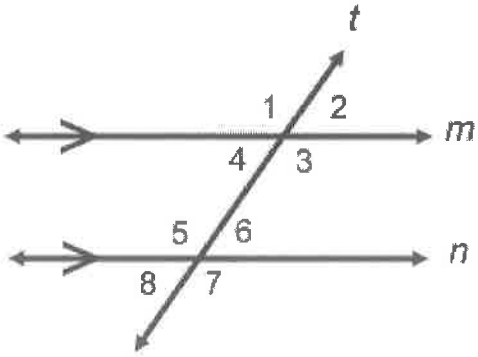
7. Find the range of possible measures for the third side of a triangle with side lengths of **15 and 8.** *Show your work and circle your final answer.*

$15+8=23$

$15-8=7$

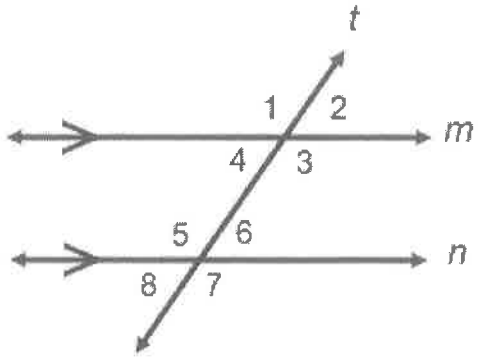
$7 <$ third side < 23

8. Given: Line m is parallel to line n with transversal t.
Prove: $m\angle 3 = m\angle 5$
(Don't use Alternate Interior Angles Theorem)



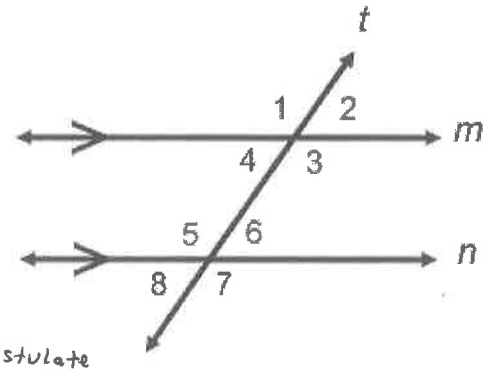
STATEMENT	**REASON**
$m \parallel n$ with transversal t.	Given
$m\angle 3 = m\angle 7$	Corresponding angles postulate
$m\angle 7 = m\angle 5$	vertical angle theorem
$m\angle 3 = m\angle 5$	transitive

9. Given: Line m is parallel to line n with transversal t.
Prove: $m\angle 3 + m\angle 8 = 180^\circ$



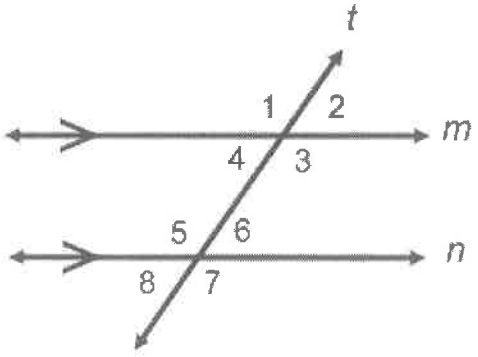
STATEMENT	REASON
m ∥ n with transversal t.	Given
$m\angle 3 + m\angle 4 = 180$	Linear Pair Postulate
$m\angle 4 = m\angle 8$	Corresponding Angles Postulate
$m\angle 3 + m\angle 8 = 180$	Substitution

10. Given: Line m is parallel to line n with transversal t.
Prove: $m\angle 1 + m\angle 8 = 180^\circ$
(Don't use Same-Side Exterior Angles Theorem)



STATEMENT	REASON
m ∥ n with transversal t.	Given
$m\angle 1 = m\angle 5$	Corresponding Angles Postulate
$m\angle 5 + m\angle 8 = 180$	Linear Pair Postulate
$m\angle 1 + m\angle 8 = 180$	Substitution

10. Given: Line m is parallel to line n with transversal t.
Prove: $m\angle 1 = m\angle 7$
(Don't use Alternate Exterior Angles Theorem)



STATEMENT	REASON
m ∥ n with transversal t.	Given
$m\angle 1 = m\angle 3$	Vertical Angle Theorem
$m\angle 3 = m\angle 7$	Corresponding Angle Postulate
$m\angle 1 = m\angle 7$	transitive