

Key

Advantage Math 1

Name _____

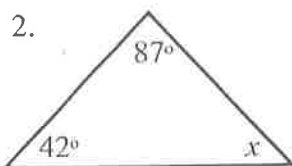
Date _____

6-4 Triangle Properties 1

6-4 + 6-5 Review 2

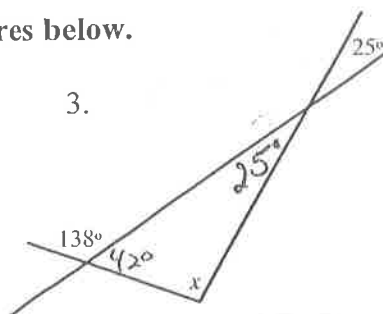
1. The three interior angles of any triangle sum to 180 degrees.

Find the value of x in each of the figures below.



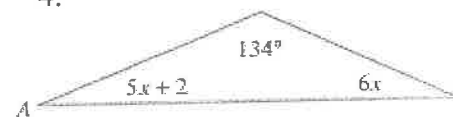
$$180 - 42 - 87 = \boxed{51^\circ}$$

3.



$$180 - 42 - 25 = \boxed{113^\circ}$$

4.



$$5x + 2 + 134 + 6x = 180$$

$$11x + 136 = 180$$

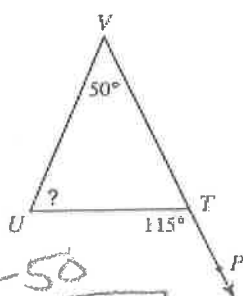
$$11x = 44$$

$$\boxed{x = 4}$$

5. The measure of an exterior angle of a triangle is equal to the Sum of the measures of the remote interior angles.

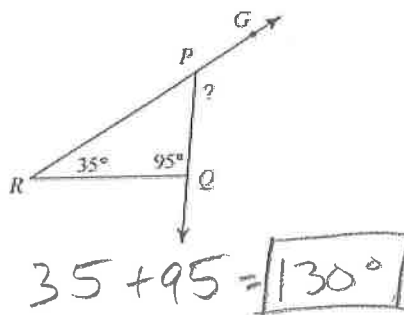
Find the measure of angle marked with a question mark in each figure below.

6.



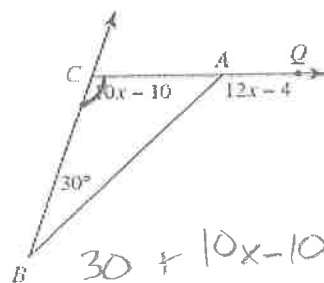
$$115 - 50 = \boxed{65^\circ}$$

7.



$$35 + 95 = \boxed{130^\circ}$$

7. Find the measure of $\angle BCQ$.



$$30 + 10x - 10 = 12x - 4$$

$$10x + 20 = 12x - 4$$

$$24 = 2x$$

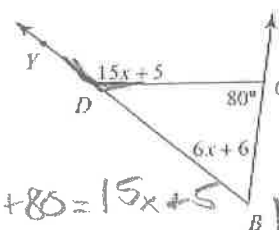
$$x = 12$$

$$\angle BCQ = 10(12) - 10$$

$$= 120 - 10$$

$$= \boxed{110^\circ}$$

8. Find the measure of $\angle YDC$.



$$6x + 6 + 80 = 15x + 5$$

$$86 = 9x + 5$$

$$81 = 9x$$

$$x = 9$$

$$\angle YDC = 15(9) + 5$$

$$= 135 + 5$$

$$= \boxed{140^\circ}$$

9. The sum of any two sides of a triangle must be greater than the length of the third side.

Can a triangle be created with the following side lengths?

10. 3, 7, 8

Yes

11. 9, 4, 5

No

12. 15, 28, 46

No

Two sides of a triangle are given. Find the range of possible lengths for the third side.

13. 2 & 10

$$10 - 2 = 8$$

$$10 + 2 = 12$$

$$8 < x < 12$$

14. 12 & 5

$$12 - 5 = 7$$

$$12 + 5 = 19$$

$$7 < x < 19$$

15. 21 & 57

$$21 + 57 = 78$$

$$57 - 21 = 36$$

$$36 < x < 78$$

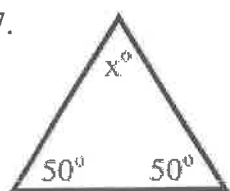
16. List two properties of isosceles triangles below.

Two congruent sides

Two congruent angles (base angles)

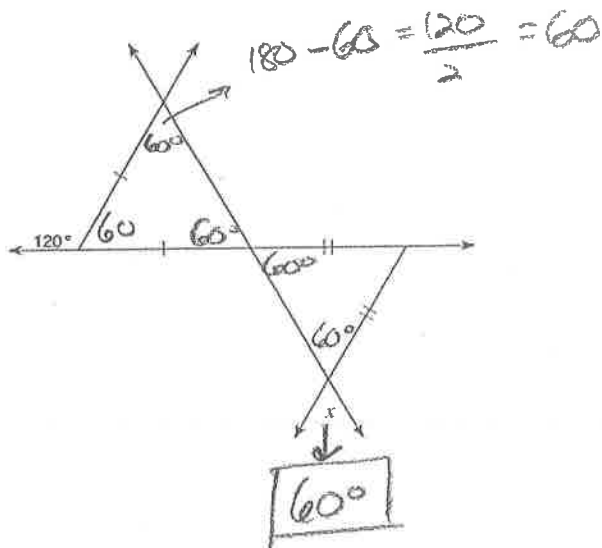
Solve for x (and y if it exists) in the problems below.

17.

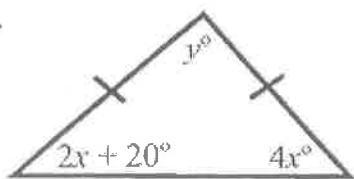


$$180 - 50 - 50 = 80$$

18.



19.



$$2x + 20 = 4x$$

$$20 = 2x$$

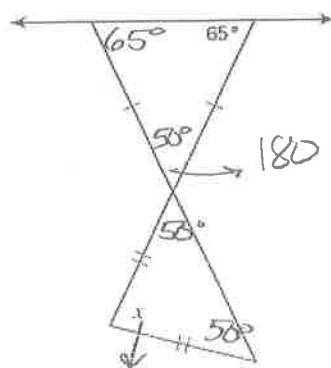
$$10 = x$$

$$y = 100$$

$$2x + 20 + 4x + y = 180$$

$$2(10) + 20 + 4(10) + y = 180$$

20.



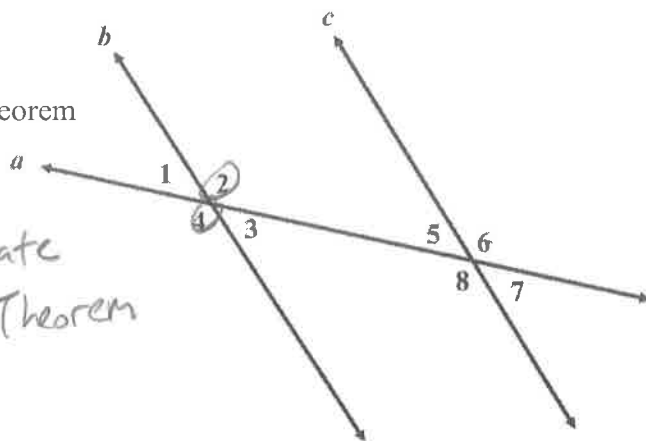
$$180 - 130 = 50$$

$$x = 180 - 100 = 80$$

21. Show two different ways to prove the following:

Given: $b \parallel c$ with transversal a

Prove: $\angle 2 \cong \angle 4$ without using the vertical angle theorem



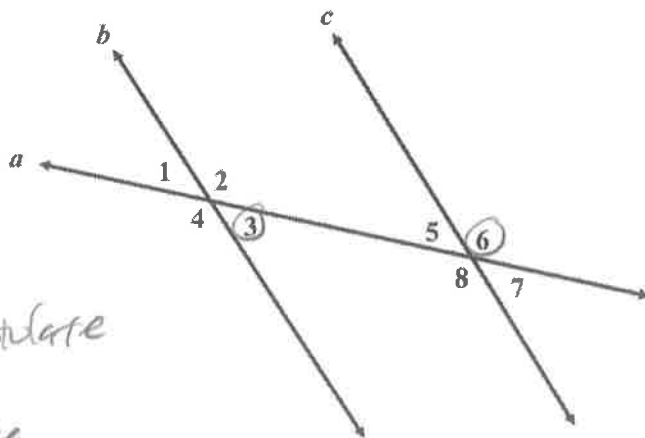
- ①
 - $b \parallel c$ with transversal a - given
 - $m\angle 2 = m\angle 6$ - Corresponding Angles Postulate
 - $m\angle 6 = m\angle 4$ - Alternate Exterior Angles Theorem
 - $m\angle 2 = m\angle 4$ - Transitive property

- ②
 - $b \parallel c$ with transversal a - given
 - $m\angle 2 + m\angle 3 = 180$ - Linear pair postulate
 - $m\angle 3 + m\angle 4 = 180$ - Linear pair postulate
 - $m\angle 2 + m\angle 3 = m\angle 3 + m\angle 4$ - Substitution
 - $m\angle 2 = m\angle 4$ - Subtraction

22. Show two different ways to prove the following:

Given: $b \parallel c$ with transversal a

Prove: $m\angle 3 + m\angle 6 = 180$



- ①
 - $b \parallel c$ with transversal a - given
 - $m\angle 3 = m\angle 7$ - corresponding angles postulate
 - $m\angle 7 + m\angle 6 = 180$ - Linear pair postulate
 - $m\angle 3 + m\angle 6 = 180$ - Substitution

- ②
 - $b \parallel c$ with transversal a - given
 - $m\angle 3 + m\angle 4 = 180$ - Linear pair postulate
 - $m\angle 4 = m\angle 6$ - Alternate exterior angle theorem
 - $m\angle 3 + m\angle 6 = 180$ - Substitution