Name _____ Date _____

Main Ideas/ Questions	Notes	8.1
Triangle Inequality THEOREM $a+b>c$ two small greater than large	Do these lengths form a triangle?	
	1. 8, 17, 24 $8+17>24$ $25>24$ yes	2. 3, 3, 7 $3+3>7$ $6>7$ no!
	3. 28, 50, 22 $22+28>50$ $50>50$ NO!	4. 52, 37, 42 $37+42>52$ $79>52$ yes

Pythagorean Theorem Converse & Classifying Triangles

Given a triangle with sides a, b, and c:

- ✓ If $a^2+b^2=c^2$, then the triangle is right
- ✓ If $a^2+b^2>c^2$, then the triangle is acute
- ✓ If $a^2+b^2<c^2$, then the triangle is obtuse

Directions:

- Determine if the three side lengths could form a triangle. $a+b>c$
- If yes, classify the triangle further as **acute**, **right**, or **obtuse**. $a^2+b^2=c^2$

1. 3, 7, 9

$3+7>9$

$10>9$ ✓

$3^2+7^2 \square 9^2$

$9+49 \square 81$

$58 < 81$

- ☐ Not a Δ
- ☐ Acute
- ☐ Right
- ☑ Obtuse

2. 20, 21, 29

$20+21>29$

$41>29$ ✓

$20^2+21^2 \square 29^2$

$400+441 \square 841$

$841 = 841$

- ☐ Not a Δ
- ☐ Acute
- ☑ Right
- ☐ Obtuse

3. 4, 11, 16

$4+11>16$

$15>16$ NO!

- ☑ Not a Δ
- ☐ Acute
- ☐ Right
- ☐ Obtuse

4. 17, 17, 22

$17+17>22$

$34>22$ ✓

$17^2+17^2 \square 22^2$

$289+289 \square 484$

$578 > 484$

- ☐ Not a Δ
- ☑ Acute
- ☐ Right
- ☐ Obtuse

5. 18, 24, 30

$18+24>30$

$42>30$ ✓

$18^2+24^2 \square 30^2$

$324+576 \square 900$

$900 = 900$

- ☐ Not a Δ
- ☐ Acute
- ☑ Right
- ☐ Obtuse

6. 8, 15, 23

$8+15>23$

$23>23$ NO!

- ☑ Not a Δ
- ☐ Acute
- ☐ Right
- ☐ Obtuse

7. The side of a triangle are of length 4.5 cm, 7.5 cm and 6 cm. Is this triangle a right triangle? If so, which side is the hypotenuse?

$4.5 + 6 > 7.5$
$10.5 > 7.5$ ✓

$4.5^2 + 6^2 \square 7.5^2$
$20.25 + 36 \square 56.25$
$56.25 = 56.25$

yes, it is a right triangle. The hypotenuse is 7.5 cm

8. A blueprint for a new triangular playground shows that the sides measure 480 ft, 140 ft, and 500 ft. Is the playground in the shape of a right triangle? Explain.

$480 + 140 > 500$
$620 > 500$ ✓

$480^2 + 140^2 \square 500^2$
$230400 + 19600 \square 250000$
$250000 = 250000$

yes, it satisfies the Pythagorean Theorem.

9. Tanya is buying edging for a triangular flower garden she plans to build in her backyard. If the lengths of the three pieces of edging that she purchases are 13 feet, 10 feet, and 7 feet, will the flower garden be in the shape of a right triangle?

$10 + 7 > 13$
$20 > 13$ ✓

$10^2 + 7^2 \square 13^2$
$100 + 49 \square 169$
$149 < 169$

NO, this will create an obtuse triangle.

10. Joe is making a sun catcher for a glass project with various types of different sized triangles including right triangles. Which of the following measurements **COULD <u>NOT</u>** represent the side lengths of a right triangle?

a) 6 cm, 8 cm, 10 cm
$6 + 8 > 10$
$14 > 10$ ✓

$6^2 + 8^2 \square 10^2$ Right △
$36 + 64 \square 10^2$
$100 = 100$

b) 4 cm, 6 cm, 10 cm
$6 + 4 > 10$
$10 > 10$ ✗

$10^2 + 23^2 \square 26^2$
$100 + 529 \square 676$ obtuse △
$629 < 676$

c) 10 cm, 23 cm, 26 cm
$10 + 23 > 26$
$33 > 26$ ✓

d) 7 cm, 24 cm, 25 cm
$7 + 24 > 25$
$31 > 25$ ✓

$7^2 + 24^2 \square 25^2$
$49 + 576 \square 625$ Right △
$625 = 625$