4.5 Converse of the Pythagorean Theorem

Objective: Use the Converse of Pythagorean Theorem.

Use side lengths to classify triangles.

Converse of the Pythagorean Theorem: If $c^2 = a^2 + b^2$,

then triangle ABC is a right triangle.

You can determine whether a triangle is acute, right, or obtuse by its side lengths.

acute all 3 angles $< 90°$
right 1 $90°$ angle
obtuse 1 angle $> 90°$

In triangle ABC with longest side c:

If $c^2 < a^2 + b^2$, then triangle ABC is acute.

If $c^2 = a^2 + b^2$ then triangle ABC is right.

If $c^2 > a^2 + b^2$ then triangle ABC is obtuse.

Checkpoint at the bottom of page 202.

1. $6^2 \square 5^2+2^2$

$36 \square 25+4$

$36 \boxed{>} 29$

obtuse

2. $17^2 \square 8^2+15^2$

$289 \square 64+225$

$289 \boxed{=} 289$

right

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

$49 \square 49+49$

$49 \boxed{<} 98$

acute

4. $24^2 \square 24^2+7^2$

$576 \square 576+49$

$576 \boxed{<} 625$

acute