

8-2 Pythagorean Theorem & Its Converse

Objectives:

- ★ Use the Pythagorean Theorem
- ★ Use the Converse of the Pythagorean Theorem

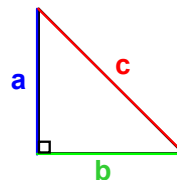
Feb 16-9:29 AM

Pythagorean Theorem

In a right triangle, the sum of the squares of the lengths of the legs is equal to the square of the length of the hypotenuse.

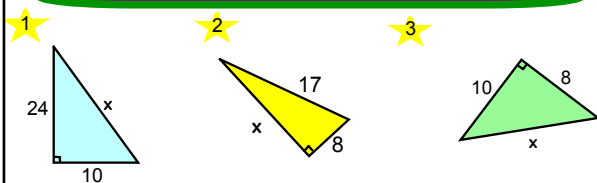
If $\triangle ABC$ is a right triangle, then $a^2 + b^2 = c^2$.

Click to see this theorem in Sketchpad!



Nov 8-11:35 AM

Examples



Apr 24-2:59 PM

Pythagorean Triple

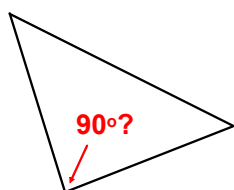
A Pythagorean Triple is a set of 3 nonzero WHOLE numbers that satisfy the equation:

$$a^2 + b^2 = c^2$$

ex. 3, 4, 5 5, 12, 13 8, 15, 17

Feb 16-10:44 AM

How can you determine if a triangle is a **RIGHT** triangle?

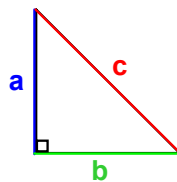


What if it was 89° or 91° ?

Feb 16-9:48 AM

Converse of the Pythagorean Theorem

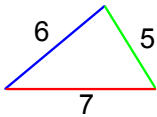
If $a^2 + b^2 = c^2$, then $\triangle ABC$ is a right triangle.



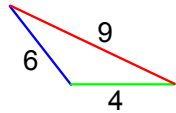
Nov 8-11:29 AM

Pythagorean Inequality Theorems

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



If $c^2 > a^2 + b^2$, then $\triangle ABC$ is an **obtuse** triangle.



Nov 20-9:01 AM



Are the given measures sides of a triangle?
If so, it is a right, obtuse, or acute triangle?

a) 40, 30, 20

b) 5, 16, 10

c) 26, 10, 24

d) 6, 8, 9

Feb 16-9:29 AM

Lesson 8-2 Practice Problems

© 2013 Kuta Software LLC. All rights reserved.

Find the missing side of each triangle. Round your answers to the nearest tenth if necessary.

1) $9^2 + x^2 = 15^2$
 $81 + x^2 = 225$
 $x^2 = 144$
 $x = 12 \text{ ft}$

2) $5^2 + 12^2 = x^2$
 $25 + 144 = x^2$
 $169 = x^2$
 $13 \text{ in} = x$

3) $6^2 + 8^2 = x^2$
 $36 + 64 = x^2$
 $100 = x^2$
 $10 \text{ mi} = x$

4) $10.9^2 + x^2 = 11.5^2$
 $118.81 + x^2 = 132.25$
 $x^2 = 13.44$
 $x \approx 3.7 \text{ km}$

Nov 14-9:34 AM

State if each triangle is a right triangle.

5) $3^2 + 4^2 = 5^2$
 $9 + 16 = 25$
 $25 = 25$
 Yes

6) $25.5^2 + 68^2 = 74.5^2$
 $5274.25 + 5550.25 = 74.5^2$
 $10824.5 = 74.5^2$
 NO!

7) $11^2 + 4^2 = (\sqrt{146})^2$
 $121 + 16 = 146$
 $137 \neq 146$
 NO!

8) $7^2 + 6^2 = (\sqrt{85})^2$
 $49 + 36 = 85$
 $85 = 85$
 Yes

Nov 14-9:37 AM

State if the three sides lengths form a right triangle.

9) 6 yd, 8 yd, 10 yd **yes**

10) 4 yd, 12 yd, 13 yd **NO**

11) $\sqrt{116}$ yd, 12 yd, 16 yd
 10.8
 $(\sqrt{116})^2 + 12^2 = 16^2$
 $116 + 144 = 256$
 $260 \neq 256$
NO

12) 12 ft, $2\sqrt{13}$ ft, 14 ft
yes
 $12^2 + (2\sqrt{13})^2 = 14^2$
 $144 + 52 = 196$
 $196 = 196$

Nov 14-9:37 AM

State if the three side lengths form an acute, obtuse, or right triangle.

13) 4 m, 12 m, 13 m **obtuse**

14) 3 mi, 4 mi, 5 mi **Right**

15) 28.5 cm, 38 cm, 46.7 cm **Acute**

16) 13 in, 17.6 in, 19.4 in **Acute**

17) $\sqrt{145}$ ft, 7 ft, $\sqrt{196}$ ft **obtuse**

18) 4 cm, $\sqrt{85}$ cm, $\sqrt{101}$ cm **Right**

Nov 14-9:37 AM

homework

Pp. 551-553 # 1-3, 5-12, 20-29

Feb 16-10:56 AM

Attachments

Pythagorean Theorem Proof.gsp