

NAME: _____
TRIANGLES

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**How Can You Determine If a Triangle
is a Right Triangle When Given Three Sides?**
(Topic #6)

Pythagorean Theorem

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

where a and b represent the legs and c always represents the hypotenuse.

NOTE: *In a right triangle, the legs are the shorter sides and the hypotenuse is always the longest side.*

EXAMPLE 1:

Determine whether each triangle with sides of given lengths is a right triangle.

a) 6 cm, 8 cm, 10 cm

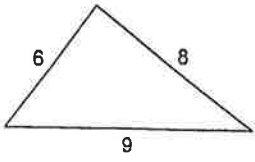
b) 9 mm, 12 mm, 16 mm

PRACTICE: Determine whether each triangle with sides of given lengths is a right triangle.

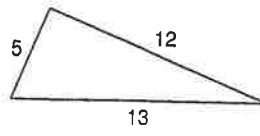
1. 18 ft, 80 ft, 82ft

2. 10 mi, 24 mi, 25 mi

3.



4.



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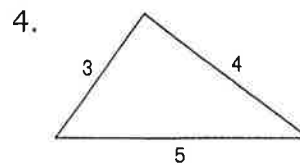
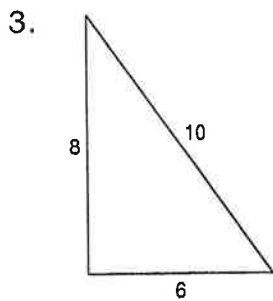
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HOMework #6

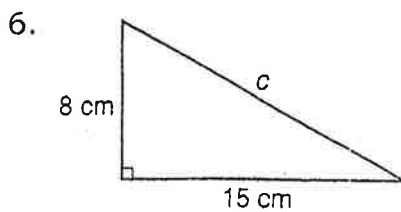
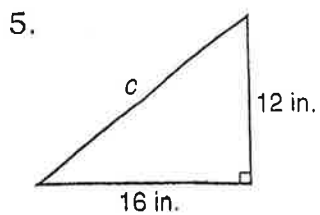
Determine whether each triangle with sides of given lengths is a right triangle.

1. 15 cm, 36 cm, 39 cm

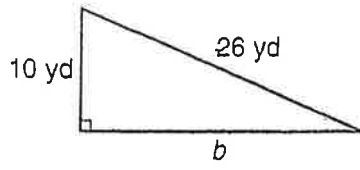
2. 16 yd, 30 yd, 34 yd



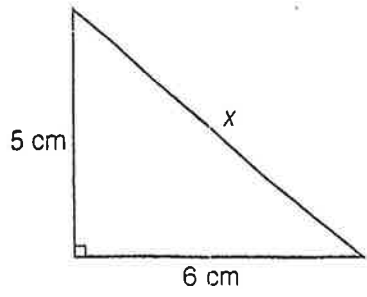
Write an equation you could use to find the length of the missing side of each right triangle. Then find the missing length. Round to the nearest tenth.



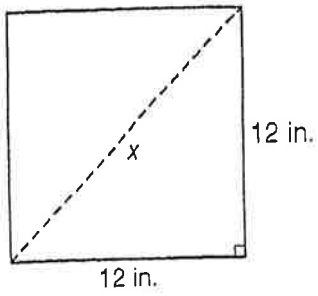
7.



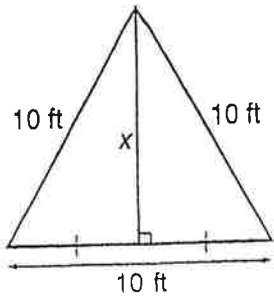
8.



9.



10.



How Can You Determine If a Triangle is a Right Triangle When Given Three Sides? (Topic #6)

Pythagorean Theorem

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

where a and b represent the legs and c always represents the hypotenuse.

NOTE: In a right triangle, the legs are the shorter sides and the hypotenuse is always the longest side.

EXAMPLE 1:

Determine whether each triangle with sides of given lengths is a right triangle.

a) 6 cm, 8 cm, ^c10 cm

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

$$6^2 + 8^2 = 10^2$$

$$36 + 64 = 100$$

$$100 = 100$$

6, 8, and 10
do form a right
A.

TRUE

b) 9 mm, 12 mm, ^c16 mm

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

$$9^2 + 12^2 = 16^2$$

$$81 + 144 = 256$$

$$225 \neq 256$$

9, 12, and 16
do not form
a right A.

False

PRACTICE: Determine whether each triangle with sides of given lengths is a right triangle.

1. 18 ft, 80 ft, ^c82 ft

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

$$18^2 + 80^2 = 82^2$$

$$324 + 6400 = 6724$$

$$6724 = 6724$$

TRUE

18, 80, and 82 do form a right A.

2. 10 mi, 24 mi, ^c25 mi

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

$$10^2 + 24^2 = 25^2$$

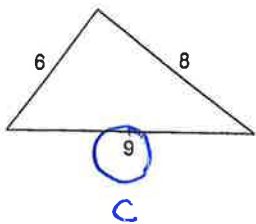
$$100 + 576 = 625$$

$$676 \neq 625$$

False

10, 24, and 25 do not form a right A.

3.



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

$$6^2 + 8^2 = 9^2$$

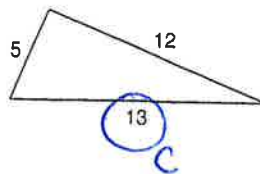
$$36 + 64 = 81$$

$$100 \neq 81$$

False

6, 8, and 9 do not form a right Δ .

4.



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

$$5^2 + 12^2 = 13^2$$

$$25 + 144 = 169$$

$$169 = 169$$

TRUE

5, 12, and 13 do form a right Δ .

HOMEWORK #6

Determine whether each triangle with sides of given lengths is a right triangle.

1. 15 cm, 36 cm, $\overset{c}{39}$ cm

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

$$15^2 + 36^2 = 39^2$$

$$225 + 1296 = 1521$$

$$1521 = 1521$$

TRUE
YES

2. 16 yd, 30 yd, $\overset{c}{34}$ yd

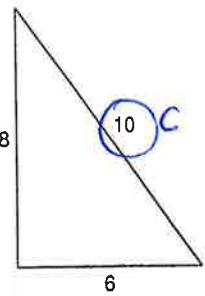
$$a^2 + b^2 = c^2$$

$$16^2 + 30^2 = 34^2$$

$$256 + 900 = 1156$$

$$1156 = 1156$$

TRUE
YES

3.  $\overset{c}{10}$

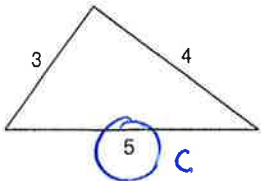
$$a^2 + b^2 = c^2$$

$$8^2 + 6^2 = 10^2$$

$$64 + 36 = 100$$

$$100 = 100$$

TRUE
YES

4.  $\overset{c}{5}$

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

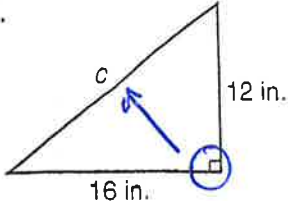
$$3^2 + 4^2 = 5^2$$

$$9 + 16 = 25$$

$$25 = 25$$

TRUE
YES

Write an equation you could use to find the length of the missing side of each right triangle. Then find the missing length. Round to the nearest tenth.

5. 

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

$$12^2 + 16^2 = c^2$$

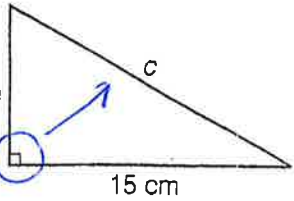
$$144 + 256 = c^2$$

$$400 = c^2$$

$$\sqrt{400} = \sqrt{c^2}$$

$$20 = c$$

in

6. 

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

$$8^2 + 15^2 = c^2$$

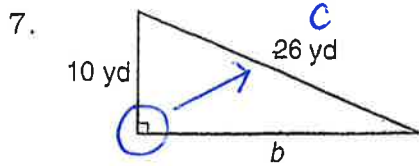
$$64 + 225 = c^2$$

$$289 = c^2$$

$$\sqrt{289} = \sqrt{c^2}$$

$$17 = c$$

cm



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

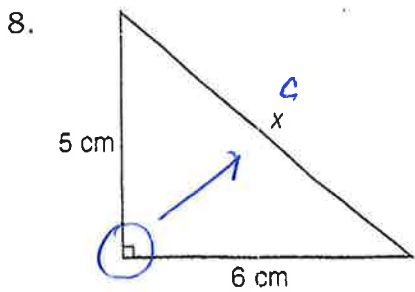
$$10^2 + b^2 = 26^2$$

$$100 + b^2 = 676$$

$$\begin{array}{r} -100 \\ \hline b^2 = 576 \end{array}$$

$$\sqrt{b^2} = \sqrt{576}$$

$$b = 24 \text{ yd}$$



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

$$5^2 + 6^2 = x^2$$

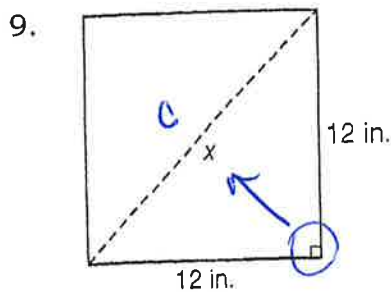
$$25 + 36 = x^2$$

$$61 = x^2$$

$$\sqrt{61} = \sqrt{x^2}$$

$$7.8 = x$$

cm



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

$$12^2 + 12^2 = x^2$$

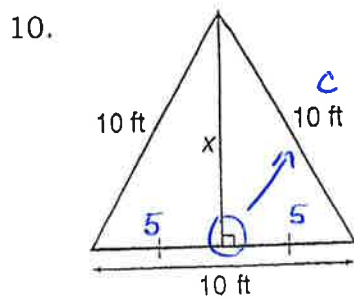
$$144 + 144 = x^2$$

$$288 = x^2$$

$$\sqrt{288} = \sqrt{x^2}$$

$$17.0 = x$$

in



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

$$x^2 + 5^2 = 10^2$$

$$x^2 + 25 = 100$$

$$\begin{array}{r} -25 \\ \hline x^2 = 75 \end{array}$$

$$\sqrt{x^2} = \sqrt{75}$$

$$x = 8.7 \text{ ft}$$