Skill check:

Write $-1.\overline{5}$ as a fraction

7-5 using the Pythagorean Theorem:

Distance Formula:

How to find the distance between two points:

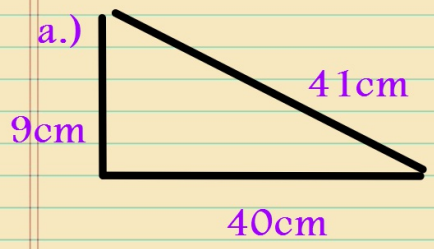
$$d=\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$$

Converse of the P. Theoem

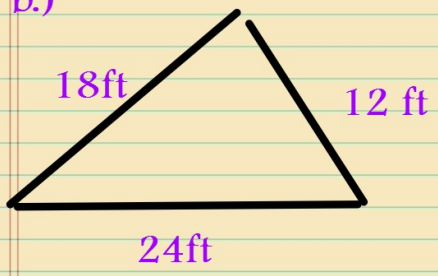
If the equation $a^2+b^2=c^2$ is true for the side lengths of a triangle, then the triangle is a right triangle.

Example 1
Identify a right triangle

a.)



b.)



Example 2
finding the distance
between two points

1.) (1,5) and (-4,-2)

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

8. To the nearest whole number, what is the distance between point $L\ (3, 5)$ and point $M\ (9, -7)$?

$x_1\ y_1$ $(3, 5)$ $(9, -7)$ $x_2\ y_2$

$$\sqrt{(9-3)^2 + (-7-5)^2}$$

$$(6)^2 + (-12)^2$$

$$\sqrt{36 + 144}$$

$$\sqrt{180}$$

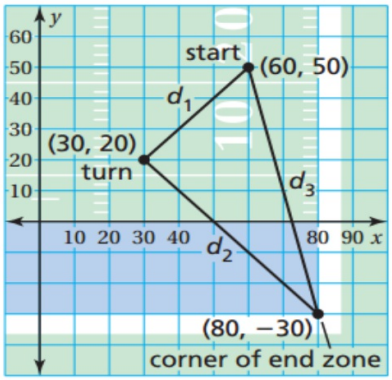
Practice

1.) (0,0) and (4,5)

2.) (7,-3) and (9,6)

3.) (-2,-3) and (-5,1)

You design a football play in which a player runs down the field, makes a 90° turn, and runs to the corner of the end zone. Your friend runs the play as shown. Did your friend make a 90° turn? Each unit of the grid represents 10 feet.



$$d_1 = \sqrt{(60 - 30)^2 + (50 - 20)^2} = \sqrt{30^2 + 30^2} = \sqrt{1800} \text{ feet}$$

$$d_2 = \sqrt{(80 - 30)^2 + (-30 - 20)^2} = \sqrt{50^2 + (-50)^2} = \sqrt{5000} \text{ feet}$$

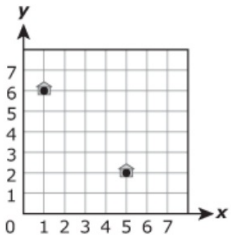
$$d_3 = \sqrt{(80 - 60)^2 + (-30 - 50)^2} = \sqrt{20^2 + (-80)^2} = \sqrt{6800} \text{ feet}$$

$$(\sqrt{1800})^2 + (\sqrt{5000})^2 \stackrel{?}{=} (\sqrt{6800})^2$$

$$1800 + 5000 \stackrel{?}{=} 6800$$

$$6800 = 6800 \checkmark$$

7. The coordinate grid below shows the location of two friends' houses.



What is the shortest distance, in units, between the houses?