3. Based on the problems above, what type of triangle is formed with side lengths that satisfy the Pythagorean Theorem? Write down the Converse of the Pythagorean Theorem.

If $a^2+b^2=c^2$, then its a Right triangle

4. Do the side lengths given below satisfy the Pythagorean Theorem? Remember to distinguish between legs (shorter sides) and the hypotenuse (longest side) and enter them into the equation correctly.

a. 11, 60, 61 $11^2+60^2=61^2$ $121+3600=3721$ $3721=3721$ ✓ yes = Right △	b. 2, 4, 6 $2^2+4^2=6^2$ $4+16=36$ $20 \neq 36$ NOT Right △
c. 14, 50, 48 $14^2+48^2=50^2$ $196+2304=2500$ $2500=2500$ ✓ yes = Right △	d. 1, 3, $\sqrt{10}$; $1^2+3^2=(\sqrt{10})^2$ $1+9=10$ $10=10$ ✓ yes = Right △
e. 2, 4, and $2\sqrt{5}$. $2^2+4^2=(2\sqrt{5})^2$ $4+16=20$ $20=20$ ✓ yes = Right △	f. 5, 6, 8 $5^2+6^2=8^2$ $25+36=64$ $61 \neq 64$ NOT Right △

5. Mr. Garcia then asks the class, "What if the tick marks in Lucy's picture are each 2 cm instead of 1 cm? What are the measures of the side lengths that form the right triangle? Do they satisfy the Pythagorean Theorem?"

(6, 8, 10)

$6^2+8^2=10^2$
$36+64=100$
$100=100$ ✓

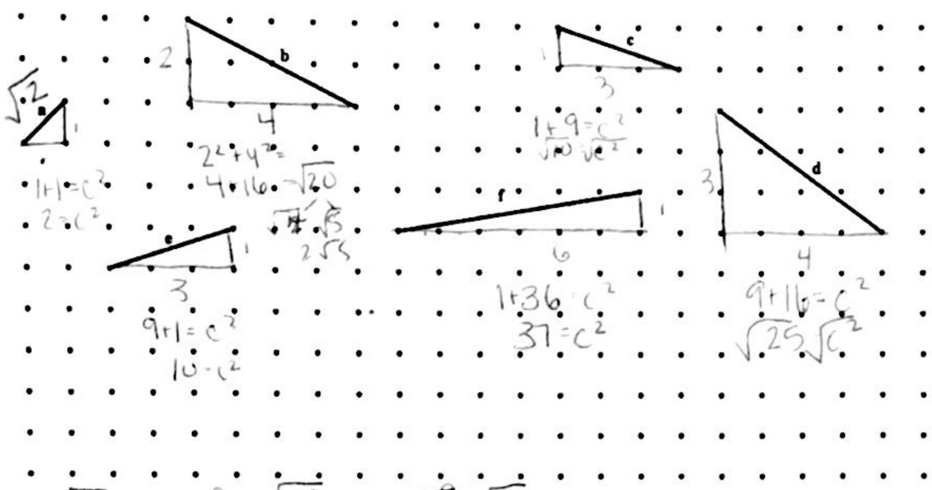
yes still works

6. What if the tick marks in Lucy's picture are each 3 cm? 0.1 cm? 10 cm? What are the measures of the side lengths that form the right triangles given these different scales and do they satisfy the Pythagorean Theorem?

always OK if side lengths are multiplied by any # consistently

Finding Distance Between Two Points

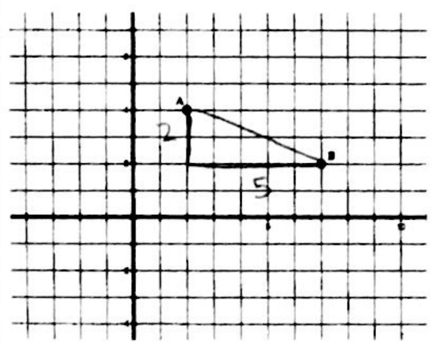
1. Find the lengths of the segments below. Assume that each horizontal and vertical segment connecting the dots has a length of 1 unit.



$a = \sqrt{2}$ $\quad b = 2\sqrt{5}$ $\quad c = \sqrt{10}$ $\quad d = 5$ $\quad e = \sqrt{10}$ $\quad f = \sqrt{37}$

Directions: Label the coordinates of each point. Then, find the distance between the two points shown on each grid below.

2.

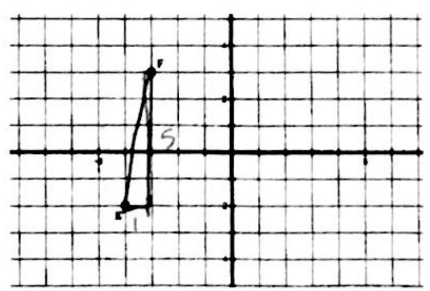


$4 + 25 = c^2$

$\sqrt{29} = \sqrt{c^2}$

$\boxed{\sqrt{29} = c}$

3.



$1 + 25 = c^2$

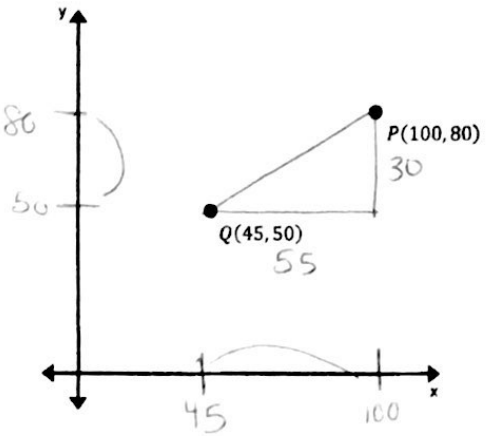
$\sqrt{26} = \sqrt{c^2}$

$\boxed{\sqrt{26} = c}$

4

The Coordinate Distance Formula

4. Find the distance between the two points given on the graph below.



$(55)^2 + (30)^2 = c^2$

$3025 + 900 = c^2$

$\sqrt{3925} = \sqrt{c^2}$

$\sqrt{25}\sqrt{157} = c$

$\boxed{5\sqrt{157} = d}$

$(x_2 - x_1)^2 + (y_2 - y_1)^2 = c^2$

5. Find the distance between the two points given below. Leave your answers in simplest radical form.

~~(difference between x's)~~^{2}

a. $A: (3,5)$ $\quad B: (6,9)$

$(6-3)^2 + (9-5)^2 = c^2$

$3^2 + 4^2 = c^2$

$9 + 16 = c^2$

$\sqrt{25} = \sqrt{c^2}$

$\boxed{c = 5}$

b. $R: (-1,4)$ $\quad S: (3,8)$

$(3 - -1)^2 + (8-4)^2 = c^2$

$4^2 + 4^2 = c^2$

$16 + 16 = c^2$

$\sqrt{32} = \sqrt{c^2}$

$\sqrt{16}\sqrt{2}$

$\boxed{4\sqrt{2} = c}$

c. $C: (0,5)$ $\quad D: (2,-3)$

$(2-0)^2 + (-3-5)^2 = c^2$

$2^2 + (-8)^2 = c^2$

$4 + 64 = c^2$

$\sqrt{68} = \sqrt{c^2}$

$\sqrt{4}\sqrt{17} = c$

$\boxed{2\sqrt{17} = c}$

d. $S: (-3,-5)$ $\quad T: (2,-7)$

$(2 - -3)^2 + (-7 - -5)^2 = c^2$

$5^2 + (-2)^2 = c^2$

$25 + 4 = c^2$

$\sqrt{29} = \sqrt{c^2}$

$\boxed{\sqrt{29} = c}$