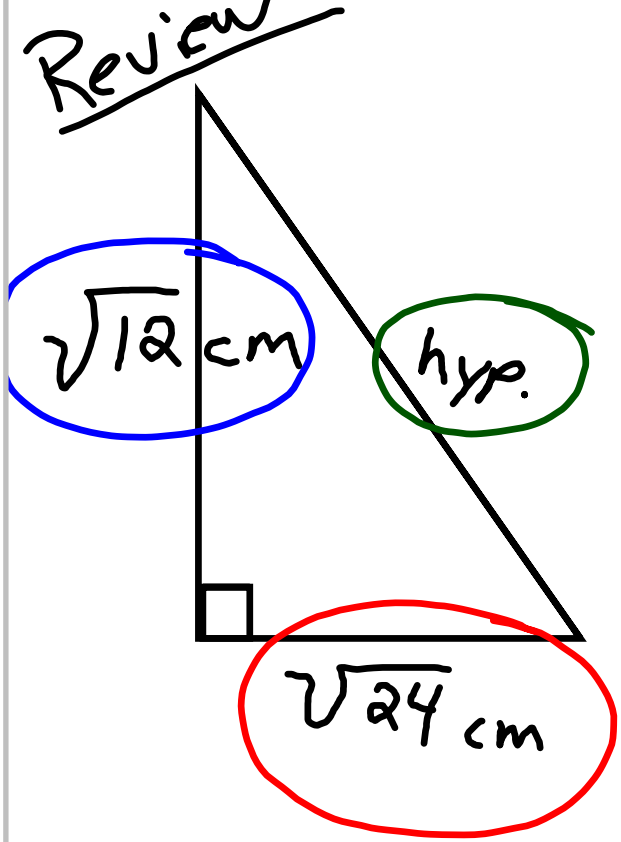
Distance Formula

May 23, 2007

Review



$(leg_1)^2 + (leg_2)^2 = (hyp)^2$

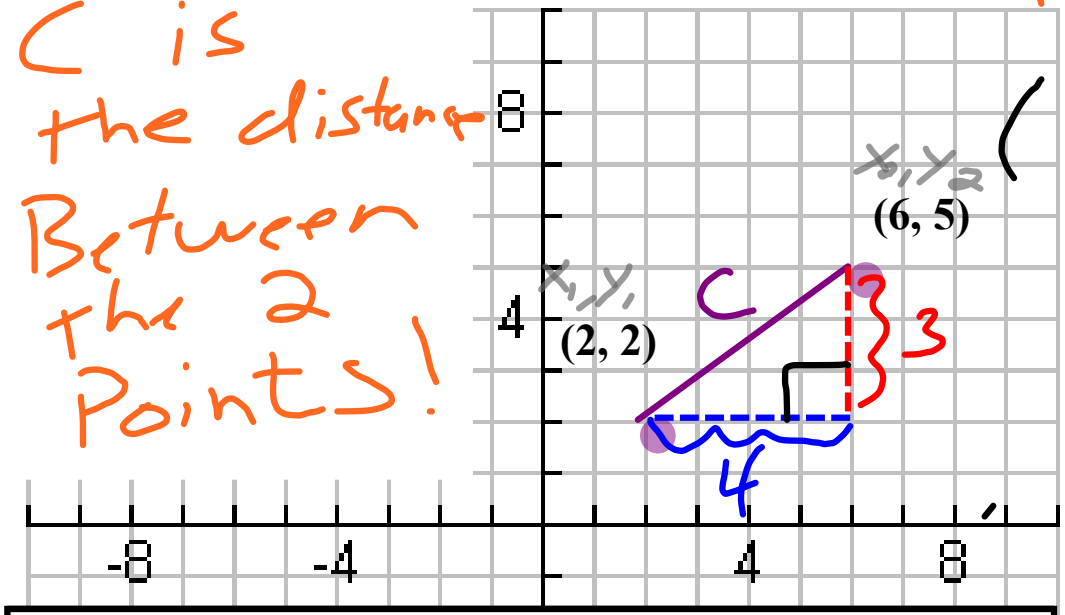
$(\sqrt{12}\,cm)^2 + (\sqrt{24}\,cm)^2 = (hyp.)^2$

$12\,cm^2 + 24\,cm^2 = hyp.^2$

$\pm\sqrt{36\,cm^2} = \sqrt{hyp^2}$

$6\,cm = hyp.$

What is the distance between the points (2, 2) and (6, 5)



C is the distance Between the 2 Points!

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

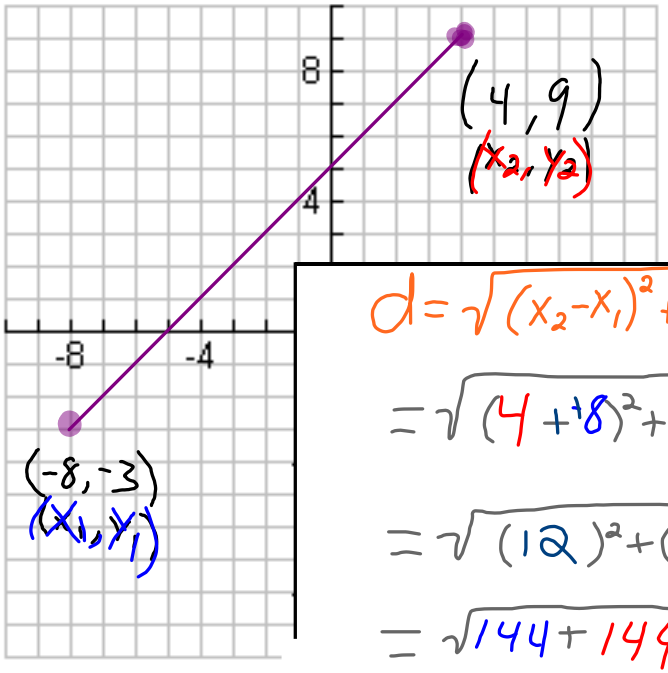
$$(leg_1)^2 + (leg_2)^2 = (hyp)^2$$

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

$$16 + 9 = c^2$$

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

$$5 = c$$



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

$$= \sqrt{(4 + 8)^2 + (9 + 3)^2}$$

$$= \sqrt{(12)^2 + (12)^2}$$

$$= \sqrt{144 + 144}$$

$$= \sqrt{288}$$

$$= \sqrt{144} \cdot \sqrt{2}$$

$$= \underline{12\sqrt{2}}$$

Find the distance Between the Following Points

① $(2, 5), (0, 4)$ — (x_1, y_1), (x_2, y_2)

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

$$= \sqrt{(0 - 2)^2 + (4 - 5)^2}$$

$$= \sqrt{(-2)^2 + (-1)^2}$$

$$= \sqrt{4 + 1}$$

$$= \sqrt{5}$$

② $(\overset{x_1}{-3}, \overset{y_1}{2}), (\overset{x_2}{2}, \overset{y_2}{-2})$

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

$$= \sqrt{(2 + 3)^2 + (-2 - 2)^2}$$

$$= \sqrt{(5)^2 + (-4)^2}$$

$$= \sqrt{25 + 16}$$

$$= \sqrt{41}$$

O.T.L.

③ (8,0), (0,6)

④ (-4,2), (-1,3)

④ $(-4,2),(-1,3)$

$(-2,-2), (2,8]$

Determine if teh three points make a right triagle

(-4, 2), (-3, 2), (1, 6)

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

$= \sqrt{(-3+4)^2+(2-2)^2}$

$= \sqrt{(1)^2+(0)^2}$

$= \sqrt{1+0}$

$= \sqrt{1}$

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

$= \sqrt{(2+3)^2+(6-2)^2}$

$= \sqrt{(4)^2+(4)^2}$

$= \sqrt{16+16}$

$= \sqrt{32}$

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

$= \sqrt{(1+4)^2+(6-2)^2}$

$= \sqrt{(5)^2+(4)^2}$

$= \sqrt{25+16}$

$= \sqrt{41}$

$(leg_1)^2 + (leg_2)^2 = (hyp)^2$

$(\sqrt{1})^2 + (\sqrt{32})^2 \stackrel{?}{=} (\sqrt{41})^2$

$1 + 32 \stackrel{?}{=} 41$

$33 \neq 41$

So... these Points Do NOT form a Rt. $\triangle$.

$(-3,-2), (3,4), (-8,3)$

O.T.L.

Pg. 733: 10, 13, 16, 20, 24