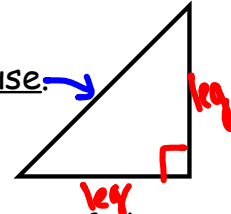4.4   The Pythagorean Theorem and the Distance Formula

In a right triangle, the sides that form the right angle are called
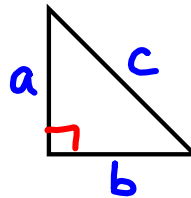<u>legs</u>.

The side opposite the right angle is called the <u>hypotenuse</u>.

leg

leg

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

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

hypot.

a c

b

Checkpoint in the middle of page 193.

1. $10^2 = a^2 + 6^2$

$100 = a^2 + 36$

$-36 \qquad -36$

$\sqrt{64} = \sqrt{a^2}$

$8 = a$

2. $17^2 = 15^2 + b^2$

$289 = 225 + b^2$

$-225 \quad -225$

$\sqrt{64} = \sqrt{b^2}$

$8 = b$

3. $c^2 = 7^2 + 8^2$

$c^2 = 49 + 64$

$\sqrt{c^2} = \sqrt{113}$

$c = 10.6$

The Distance Formula: Finds the distance between two points in a coordinate plane.

$$(x_1, y_1) \quad (x_2, y_2)$$

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

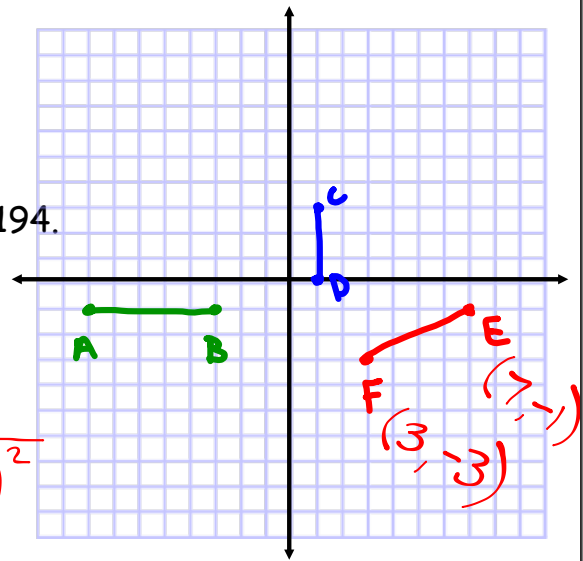Checkpoint at the bottom of page 194.

1. $AB = 5$

2. $CD = 3$

3. $EF = \sqrt{(7-3)^2 + (-1--3)^2}$

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

$$= \sqrt{16 + 4}$$

$$= \sqrt{20}$$

$$= 4.5$$

PEMDAS

4. $A(0,0) \quad B(3,4)$

$$AB = \sqrt{(3-0)^2 + (4-0)^2}$$

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

$$= \sqrt{9 + 16}$$

$$= \sqrt{25}$$

$$= 5$$

(On graph: points labeled A, B, C, D, E, F with coordinates E$(7,-1)$, F$(3,-3)$)

Name
4.4
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Notes 4.5