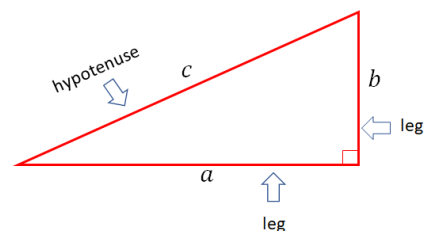


2.2 Length of a Line Segment

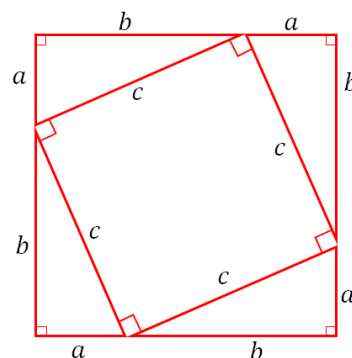
A Pythagorean Theorem

- ✓ In a right triangle the square of the length of the hypotenuse is equal to the sum of the squares of the two shorter side lengths:

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



Ex 1. Prove the Pythagorean theorem. Hint: Use the diagram on the right.



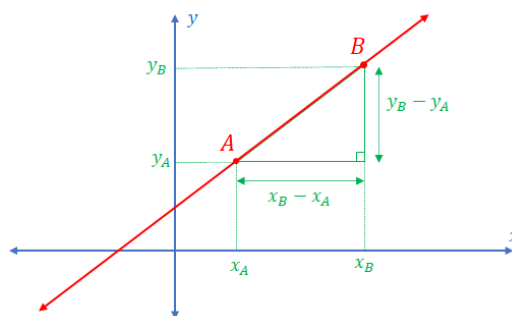
Ex 2. Find the length of the diagonal of a rectangular box 2 cm by 3 cm by 4 cm.

B Length of a Line Segment

The length of a line segment AB can be determined by:

$$AB = \sqrt{(x_B - x_A)^2 + (y_B - y_A)^2}$$

where $A(x_A, y_A)$ and $B(x_B, y_B)$.



Ex 3. Find the distance between the points $A(-2,4)$ and $B(3,-1)$.

Ex 4. Find the length of the median line segment from the vertex A for the triangle defined by the vertices $A(1,2)$, $B(2,5)$ and $C(-4,3)$.

Ex 5. Find the perimeter for the triangle defined by the vertices $P(-3,4)$, $Q(2,-6)$ and $R(-5,1)$.

Ex 6. Find the distance from the origin of the coordinate system to the midpoint of the line segment defined by $P(7, -5)$ and $Q(3, 1)$.

Ex 7. (Challenge) Find the set of all points equidistant from the following two points: $E(1, -2)$ and $F(-3, 0)$.

Reading: Textbook Pages 70-76

Homework: Textbook Page 76-79 # 1a, 2a, 3c, 6, 7, 8, 12, 15, (19, 20 optional)