Pythagorean Theorem

Vectors at right angles are easy...

a

b

...rearrange the vectors head to tail...

a

b

...draw the resultant from the tail of the first to the head of the last...

c

a

b

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

$$c = \sqrt{a^2 + b^2}$$
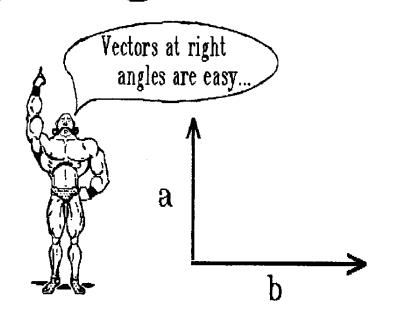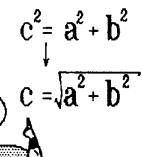
...substitute the values for a and b into the <u>Pythagorean Theorem</u>, and solve for c.

Directions: Answer each question based your knowledge of distance, displacement, vectors, and resultants.

1. A person runs 3km north then 4km east.
   a) How far did they travel (distance)?
   b) How far are they from where they started (displacement)?

2. A jet pilot flies 100km north to an airport, then 1400km east to an airport, then finally 1000km north to another airport.
   a) What is the total distance covered by the plane?
   b) How far is the pilot from the original point of take off?

3. A dog runs 5m north, then 3m south, then 20m east, then 6m west then 2m north, then 4m north, then 6m east, 10m south, then 2m west, then 4m north.
   a) What's the dogs distance?
   b) what's his displacement from his starting place?