

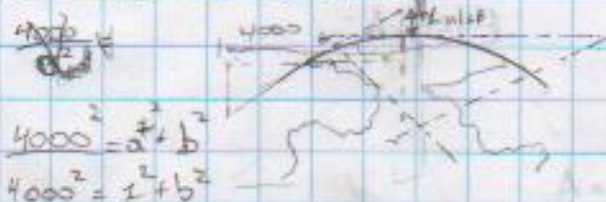
6. THE PYTHAGOREAN THEOREM ($a^2 + b^2 = c^2$, where c is the side opposite the right angle in a right triangle) may be used to solve some interesting problems. For example, a person in an airplane can see over a distance equal to the length of a line from his eye to the horizon. This line just "touches" the surface of earth and is called a tangent. It is a geometric fact that the radius of earth drawn to this point of contact is perpendicular to the tangent. Assuming the earth's radius to be 4000 miles, what is the distance a person can see over the earth's surface from a plane one mile high? (1 mile = 5280 ft).

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

$$c^2 = 4000^2 + 1^2$$

$$c = \sqrt{16 + 1}$$

$$c = 16384 \text{ mi}$$



$$4000^2 = 1^2 + b^2$$

$$b^2 = 4000^2 - 1^2$$

$$b = \sqrt{15999999}$$

$$b = 3999.999$$

$$b \approx 3999$$

$$b^2 = 4000^2 - 1^2$$

$$b = \sqrt{15999999}$$

$$b = 3999.999$$

$$b \approx 3999$$

7. A four-sided figure whose opposite sides are parallel is called a parallelogram. It can be shown that its opposite sides are equal and opposite angles are equal. Use these properties to show that triangles EAD and BFC are congruent and



interchangeable, therefore, parallelogram ABCD = rectangle ABFE.

$$\frac{AE}{ED} = \frac{BF}{FC}$$

$$ED^2 + FC^2 + AE^2 + BF^2$$

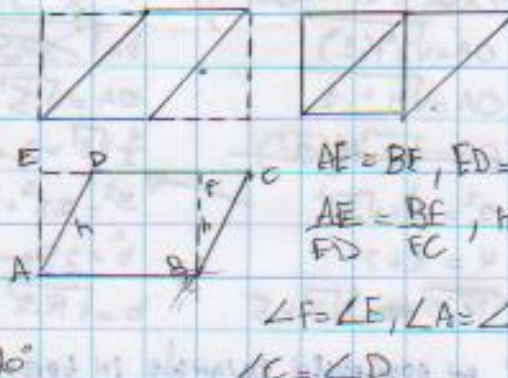
$$= h^2 + h^2$$

EDC cross AD

$$\angle D = \text{supp } \angle A$$

$$\angle A = 180 - 90 = 90$$

$$\angle A < 90^\circ, \angle D > 90^\circ$$



$$AE = BF, ED = FC$$

$$\frac{AE}{ED} = \frac{BF}{FC}, h = h$$

$$\angle F = \angle E, \angle A = \angle B$$

$$\angle C = \angle D$$

8. By drawing a diagonal in a parallelogram use the information developed in problem 7 to show that the area of