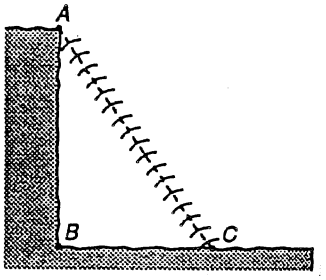
Honors Geometry Ch 9
Word Problems

Solve on a separate sheet. Draw a sketch for each problem. Be sure to show the use of the Pythagorean Theorem in each.

1. A triangular plot of land has boundary lines 45 meters, 60 meters, and 70 meters long. The 60 meter boundary line runs north-south. Is there a boundary line for the property that runs due east-west?

2. At Martian high noon, Dr. Rhonda Bend leaves the Martian U.S. Research Station traveling due east at 60 km/hr. One hour later Professor I.M. Bryte takes off from the station heading north straight for the polar ice cap at 50 km/hr. How far apart will the doctor and the professor be at 3 P.M. Martian time? Express your answer to the nearest kilometer.

3. Dr. Rhonda Bend is exploring the Martian landscape. She is standing at point *C*, 288 meters from the base of a vertical cliff (point *B*). To find the height of the cliff, she focuses a sonic beam at a rock on the top of the cliff (point *A*) as shown in the diagram on the right. The beam bounces off the rock and returns. She records the time it takes for the sonic beam to return and calculates the distance from *A* to *C* to be 480 meters. What is the height of the cliff to the nearest meter?



4. The legs of an isosceles triangle are 6 inches and the base is 8 inches. Find the area.

5. A woman travels one mile due north, then two miles due east, then three miles due north again, and then once more east for 4 miles. How far is she from her starting point? (It is less than $5 + \sqrt{5}$ miles.)

David and Goliath

6. Once upon a time there lived a boy named David Dogood, but most people called him Dave for short. Dave was the city frisbee champ.

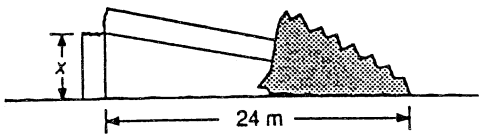
On the other side of town lived Goliath. Most people called him "Goliath Sir." Goliath was the leader of a club called the "Thugs." Goliath worked at a circus. He was billed as the meanest man on stilts.

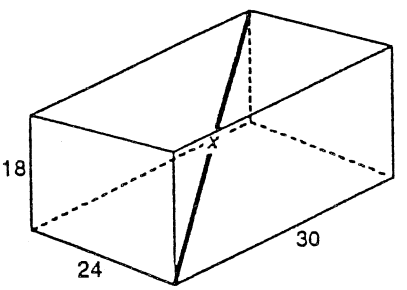
One day there came a showdown. Dave stood one meter to his shoulders. ← shoots from this point. Dave had a strong shot with his frisbee, but it was only good within a range of 26 meters. On stilts Goliath's nose was 25 meters above the ground. His nose was his only weakness (aside from chocolate cake). Goliath's nose bled very easily, causing him to faint. Dave had to get close enough for his frisbee shot to hit the nose of Goliath. How close did he have to get?

7. The area of an isosceles right triangle is 98 square inches. What is the length accurate to the nearest inch of the hypotenuse?

8. Meteorologist Paul Windward and his fiancee, geologist Raina Stone, are rushing to Lost Wages, Nevada, to wed at the Lost Wages Wedding Emporium. Paul lifts off in his balloon at noon from Pecos Gulch heading due east for Lost Wages. With the prevailing wind blowing from west to east, he averages a land speed of 30 km/hr. This allows him to arrive in Lost Wages in 4 hours. Meanwhile Raina is 160 km to the north of Pecos Gulch. At the moment of Paul's lift off, Raina hops into her Jeep and heads directly for Lost Wages. At what average speed must she travel to arrive at Lost Wages at the same time as Paul?

9. A giant California redwood tree 36 meters tall cracked in a violent earthquake and fell as if hinged. The tip of the once beautiful tree hit the ground 24 meters from the base. Researchers want to investigate the crack. How many meters up from the base of the tree do the researchers have to climb? See the diagram below.





10. What is the longest stick that can be placed inside a box with inside dimensions of 24 inches, 30 inches, and 18 inches? See the diagram above.

11. A 25-foot ladder is placed against a building. The bottom of the ladder is 7 feet from the building. If the top of the ladder slips down 4 feet, how many feet will the bottom slide out? No, it is not 4 feet. This is a two-step problem, so draw two right triangles.

12. The front and back walls of an A-frame cabin are shaped like isosceles triangles, each with a base of 10 meters. The equal sides of each isosceles triangle are 13 meters. The entire front of the cabin is made of double-pane insulated glass that is 1 cm thick. What is the area of one isosceles triangle? If the glass was purchased for $120 per square meter, what did the glass for the front of the cabin cost?