April 17 Park

Hw: 9 questions in "Trigonometry Application Review" page.

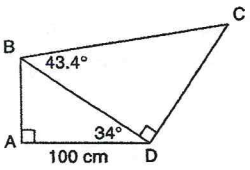
Name _____

6.7 Problems Involving Two Right Triangles

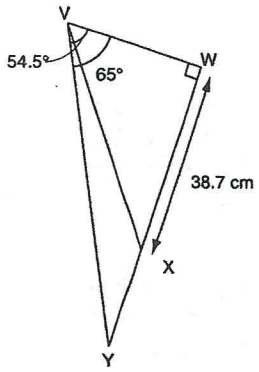
MATHPOWER™ 10, Ontario Edition, pp. 352–359

- To solve a problem involving two right triangles using trigonometry,
  - a) draw and label a diagram showing the given information, and the length or angle measure to be found
  - b) identify the two triangles that can be used to solve the problem, and plan how to use each triangle
  - c) solve the problem and show each step in your solution
  - d) write a concluding statement giving the answer

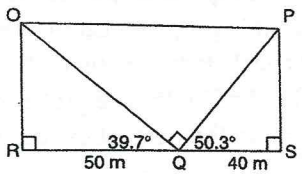
1. Find BC, to the nearest centimetre.



2. Find XY, to the nearest tenth of a centimetre.



3. Find PQ, to the nearest tenth of a metre.



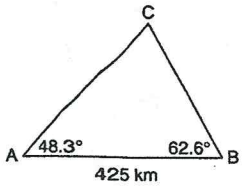
4. Problem Solving From a point on the ground, a student sights the top and bottom of a 15-m flagpole on the top of a building. The two angles of elevation are 64.6° and 57.3°.

a) Draw a diagram for the information given in the problem.

b) How far is the student from the foot of the building? Round your answer to the nearest tenth of a metre.

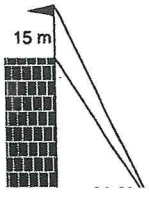
5. Application From two tracking stations 425 km apart, a satellite is sighted at C above AB, making ∠CAB = 48.3° and ∠CBA = 62.6°.

Find the height of the satellite, to the nearest tenth of a kilometre.



6. Problem Solving Two buildings are 14.7 m apart. From the top of one building, the angles of depression of the top and bottom of the second building are 27.5° and 63.8°. Find the heights of the buildings, to the nearest tenth of a metre.

1. 165 cm
2. 20.5 cm
3. 57.5 m
4. a)



b) 27.4 m

5. 301.6 km
6. 29.9 m, 22.2 m

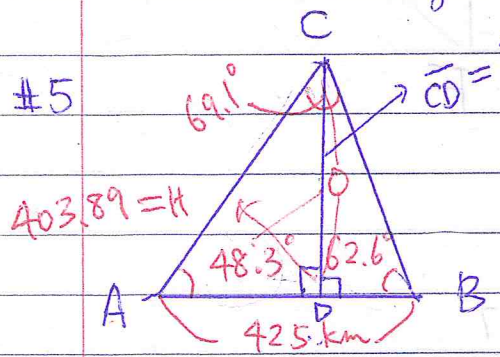
d

April 17 MPM2D Park

Reminder: Unit Test on Monday!

6.7 Problems Involving Two Right Triangles

#5



$\angle C = 180 - 48.3 - 62.6$

$\angle C = 69.1°$

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

$$\frac{\sin 69.1°}{425} \quad \frac{\sin 62.6}{\overline{AC}}$$

$$\overline{AC} \cdot \sin 69.1° = \sin 62.6 \times 425$$

$$\frac{\overline{AC} \cdot \sin 69.1°}{\sin 69.1°} = \frac{\sin 62.6 \times 425}{\sin 69.1°}$$

$$\overline{AC} = \frac{0.8878 \times 425}{0.93421}$$

$$\overline{AC} = 403.89$$

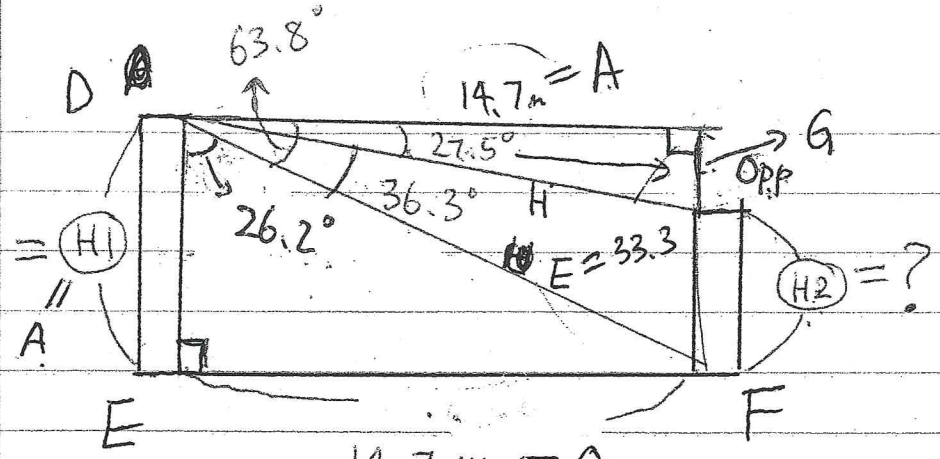
SOH $\Rightarrow \sin 48.3° = \frac{O}{H} = \frac{\overline{CD}}{403.89}$

$$403.89 \times \sin 48.3 = \frac{\overline{CD}}{403.89} \times 403.89$$

$$301.56 \text{ km} = \overline{CD}$$

∴ The height of the satelite is 301.6 km

#6.



$14.7\ m = Opp$

$\angle D = 90 - 63.8 = 26.2°$

$$\text{Tan } 26.2° = \frac{O}{A} = \frac{14.7}{H1}$$

$$\frac{\text{Tan } 26.2°}{1} = \frac{14.7}{H1}$$

$$H1 \cdot \text{Tan } 26.2° = 14.7$$

$$H1 = \frac{14.7}{\text{Tan } 26.2°}$$

$$H1 = 29.87\ m$$

$$29.87^2 + 14.7^2 = E^2$$

$$\sqrt{1108.31} = \sqrt{E^2}$$

$$33.3 = E$$

∴ First Building is 29.9m and the Second building is 22.2m

$$* \quad \text{Tan } 27.5° = \frac{O}{A} = \frac{G}{14.7}$$

$$14.7 \times \text{Tan } 27.5 = \frac{G}{14.7} \times 14.7$$

$$14.7 \times \text{Tan } 27.5° = G$$

$$G = 7.65$$

$$\therefore H2 = 29.87 - 7.65$$

$$= 22.22\ m$$