Chapter 3: Trigonometry

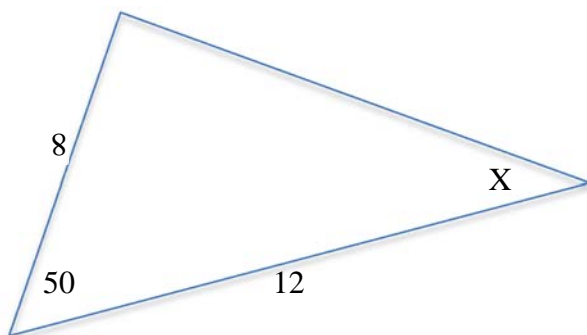## 3.8 Cosine Law Problems

Cosine Law

$$a^2 = b^2 + c^2 - 2bc\,cosA$$

Two-Step Problem:

Example #1

Word Problems:

Example #1: At Science World, there is a giant pendulum on display. The line is 30 feet long, and when the pendulum swings from side to side, the horizontal distance it travels is 8 ft. Determine the angle through which the pendulum swings. Round your answer to the nearest inch.

Example #2: Two boats leave the dock at the same time. One is going an average of 30 km/h in the direction N30W, and the other is going an average of 24 km/h in the direction N25E. How far apart are the boats after 1.5 hours?

Assignment:

1) The pendulum of a grandfather clock is 100 cm long. When the pendulum swings from on side to the other side, the horizontal distance it travels is 9.6 cm. Determine the angle through which the pendulum swings.

2) Determine the **perimeter** (total of all three sides) of triangle *SRT*, if $\angle S = 60^0$, $r = 15cm, \ t = 20cm$

3) A parallelogram has sides that are 8cm and 15cm long. One of the angles in the parallelogram measures 70^0. Determine the length of the shorter diagonal.

4) A clock has a minute hand that is 20 cm long and an hour hand that is 12 cm long. Determine the distance between the tips of the hands at 2:00 and 10:00
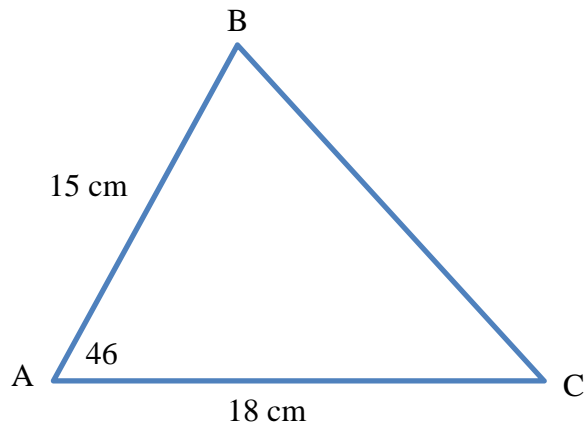
5) Two drivers leave their school at the same time and travel on straight roads that diverge by 70^0. One driver travels at an average speed of 33.0 km/h. The other driver travels at an average speed of 45.0 km/h. How far apart will the other drivers be after 45 minutes?

Answers:
1) 5.5^o 2) 53.0 cm   3) 14.4 cm   4) 17.4 cm   5) 34.4 km

Practice Quiz

1) Use the Cosine Law to find the measure of angle C

2) A parallelogram has adjacent sides that are 11.0 cm and 15.0 cm long. The angle between those sides is 50^0. Determine the length of the shorter diagonal to the nearest tenth of a centimeter.

Answers: 1) 54.9^0 2) 11.6 cm