Introduction
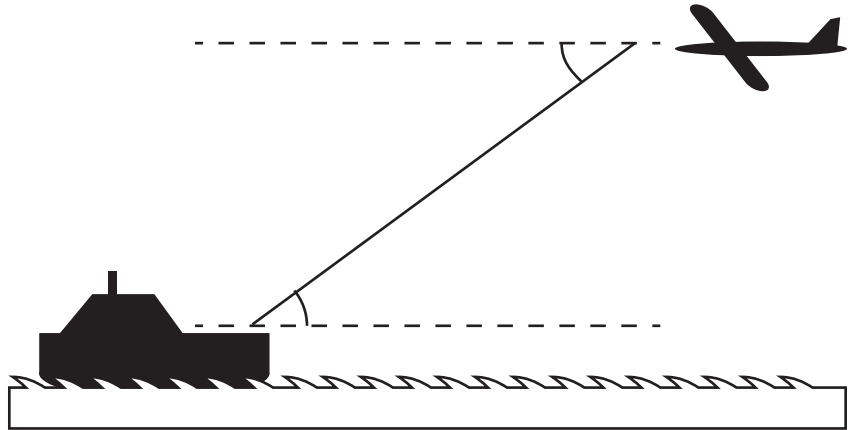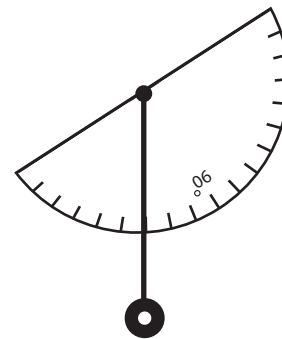
Trigonometry II

a) A sailor on the deck of a ship observes an airplane in the sky. Label the diagram using the following terms:

• horizontal line
• line of sight
• angle of elevation
• angle of depression

b) The sailor uses a simple clinometer to measure the angle of elevation. A diagram of the clinometer is shown to the right. What is the angle of elevation?
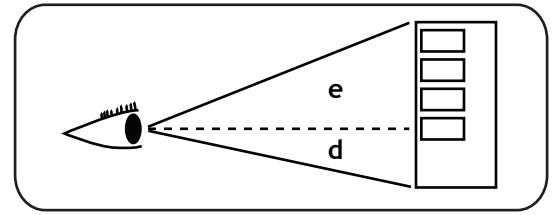
c) If the sailor tilts her head 30° upwards to see the plane, and the plane is flying at an altitude of 3000 m, what is the horizantal distance from the boat to the plane?

Example 1   Solve for the unknown length.
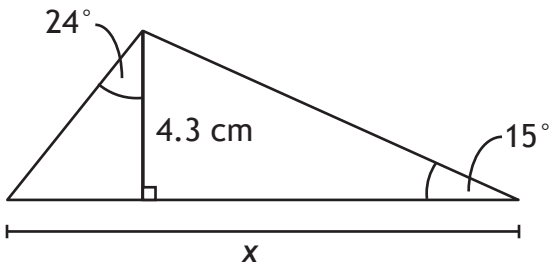
a)

24°

4.3 cm

15°

x

b)

7.7 cm

18°

40°

x

c)

x

48°

6.1 cm

16°

Example 2   Solve for the unknown length.

a)

3.8 cm

8 cm

21°

x

b)

18°

7.2 cm

x

31°

c)

x

34°

27°

14.3 cm
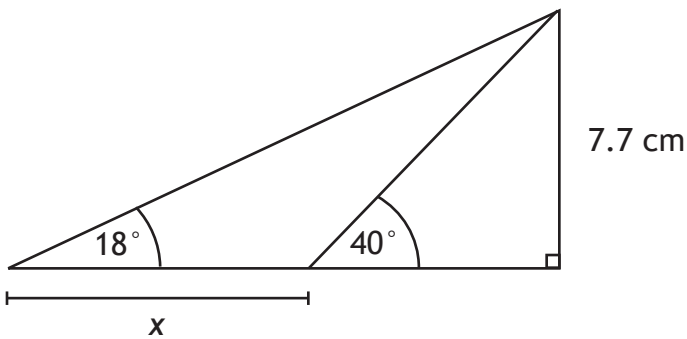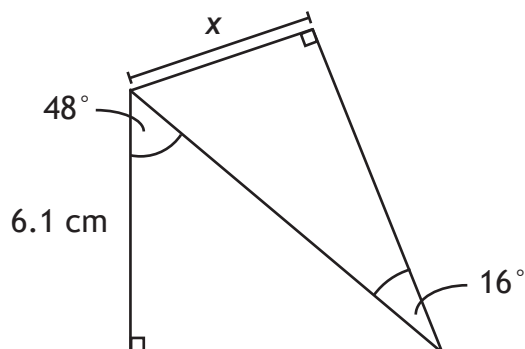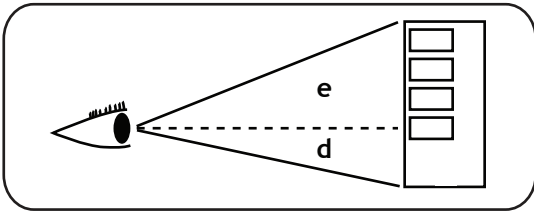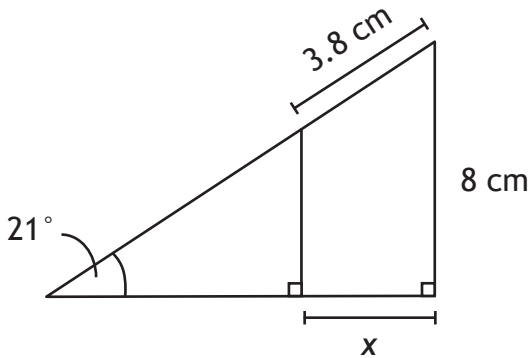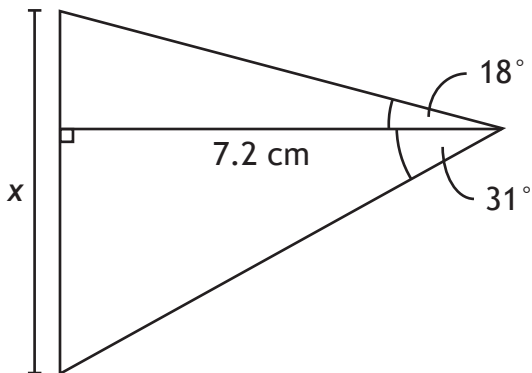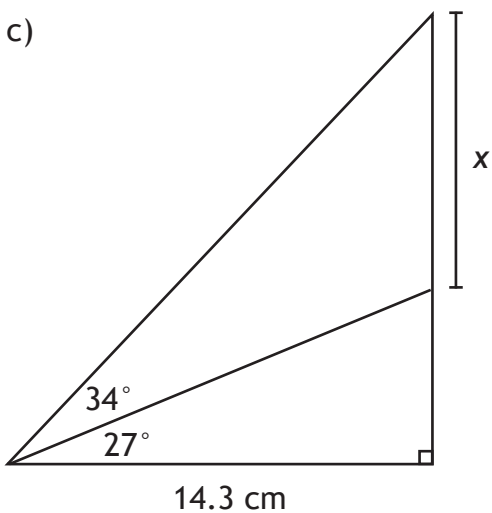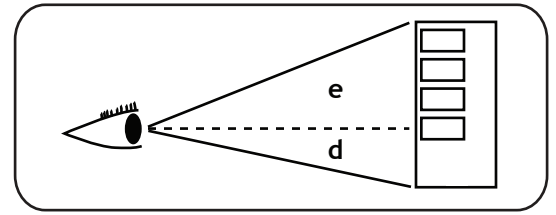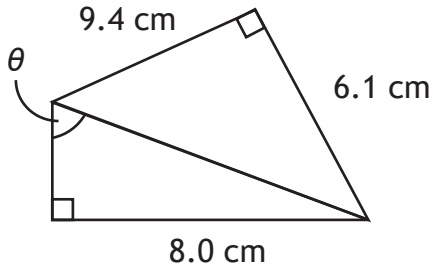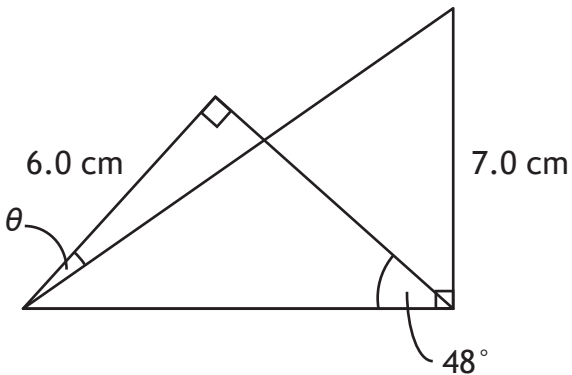
Measurement
LESSON FOUR - *Trigonometry II*
Lesson Notes

Example 3 Solve for the unknown angle.

a)

9.4 cm

θ

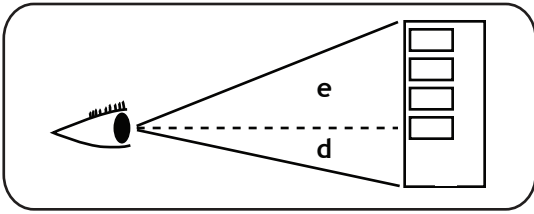6.1 cm

8.0 cm

b)

6.0 cm

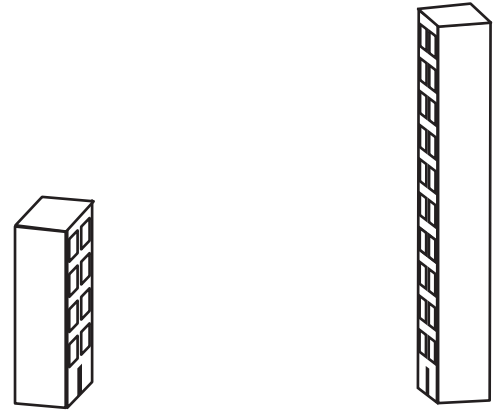7.0 cm

θ

48°

c)

8.0 cm

22°

θ

8.3 cm

Example 4

Janis lives on the 4th floor of her apartment building. From her window, she has to tilt her head 52° upwards to see the top of the neighbouring building. She has to look down 35° to see the base of the neighbouring building. The distance between the buildings is 80 m.

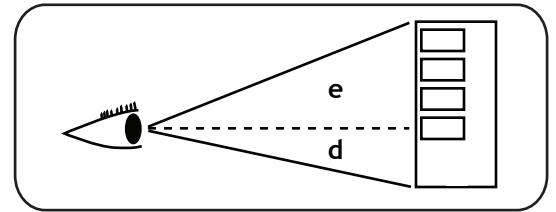a) Calculate the height of the neighbouring building.

b) What measuring tools could Janis use to obtain the angles and distance between the buildings?

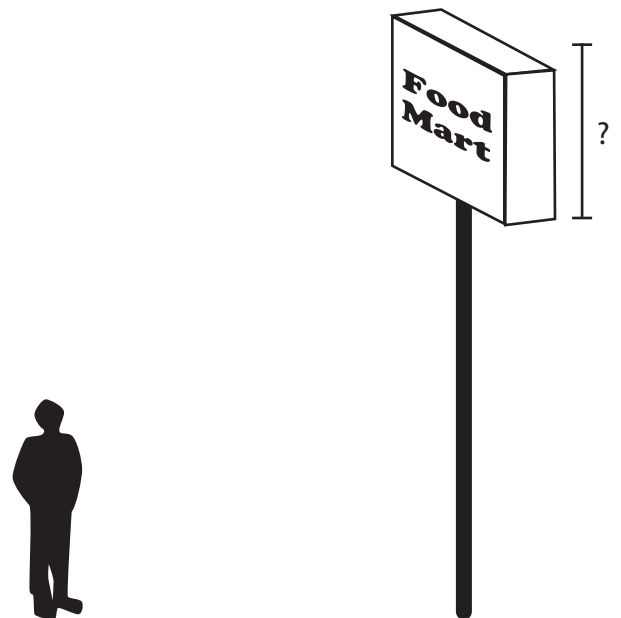c) Which quantities in this question were direct measurements? Which were indirect measurements?
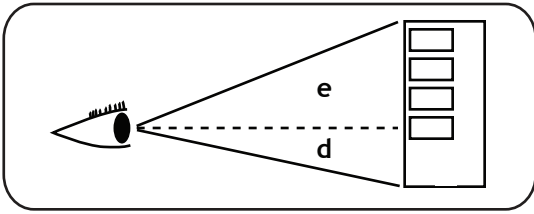
Example 5

The sign for a resturant is mounted on a pole. From a position 5 m from the base of the pole, Mike has to look up 42° to see the bottom of the sign, and 52° to see the top of the sign. How tall is the sign?

Example 6

Kevin and Rob are standing on opposite sides of Edmonton's River Valley. In order to see a boat on the river, Kevin has to look down 32°, and Rob has to look down 38°. The width of the valley is 750 m, and the boat is exactly halfway between Kevin and Rob. How much higher is Rob than Kevin?

Rob

Kevin

750 m