Chapter 1 Homework

Homework answers, last assignment from Chapter 1

2/12/06

22. a) \( b = 5.7, \angle B = 55^\circ, c = 7.0 \) (6.96)  
   b) \( b = 8.3, \angle A = 40^\circ, c = 10.9 \)  
   c) \( a = 9.1, \angle B = 25^\circ, b = 4.2 \)

23. a) Use the Law of Cosines to find side \( c \), then the Law of Sines to find one of \( \angle A \) or \( \angle B \), then subtraction from 180° to find the other.  
   b) Use the Law of Cosines to find any angle, then the Law of Sines to find a second, then subtraction from 180° to find the third.  
   c) Find \( \angle A \) by subtraction from 180°, then use the Law of Sines to find sides \( b \) and \( c \).

   d) Use the same procedure as in part (a).

24. a) \( \angle C = 180^\circ - 54^\circ - 62^\circ = 64^\circ, \ a/\sin 54^\circ = 9.6/\sin 64^\circ, \) so \( a = 8.64 \)  
   b) \( \angle C = 80^\circ, \ a/\sin 40^\circ = 13/\sin 80^\circ, \) so \( a = 8.5 \)

26. a) Find one of the angles, say \( \angle A \), using \( \cos A = (b^2 + c^2 - a^2)/2bc = (25 + 36 - 9)/(2 \cdot 5 \cdot 6) = 0.86667. \) Then use the Law of Sines to find a second angle, say \( \angle B \): \( \sin B/5 = \sin 29.9^\circ/3; \) \( \sin B = 0.4154, \) and \( \angle B = 56.2^\circ. \) Then by subtraction from 180°, \( C = 93.9^\circ. \)

   b) This is the same situation as in (a), with different numbers, and you can follow the same procedure. \( A = 71.8^\circ, \ B = 58.8^\circ, \ C = 49.4^\circ. \)

27. a) Neither  
   b) Law of Cosines  
   c) Law of Cosines  
   d) Neither  
   e) Neither  
   f) Law of Cosines  
   g) Neither  
   h) Neither  
   i) Neither

28. Since the ratio of height to shadow is the same for you and the building, we have the proportion your height/9 = height of the building/30. You substitute your own height. If you are, for example, 6 feet tall, then \( 6/9 = \) height of the building/30, and the building is 20 feet tall. To estimate the time of day, note that \( \tan^{-1}(2/3) = 33.7^\circ, \) so the sun is 33.7° above the horizon. This is a little more than one sixth of the 180° it goes from east to west each day. If it is March or September there is about 12 hours from sunrise at about 6 a.m. to sunset at about 6 p.m., and so it is about 2 hours after sunrise, or 8 a.m., or two hours before sunset, or 4 p.m. At other times of the year the hours between sunrise and sunset are different, so the answer is different.