Chapter 4 Review

Student Text Pages
222–223

Suggested Timing
80 min

Related Resources
- BLM 4–11 Chapter 4 Review

Accommodations

Spatial–For questions, such as **questions 1, 2, and 4**, provide students with assistance in draw a diagram to represent the situation.

Perceptual–encourage students to sketch diagrams for **questions 1, 2, 4, 7, and 12 to 14**.

Motor–provide a handout of the Review questions with spaces for students to write the answers

Language–allow students to work in pairs to provide support in reading the questions

Memory–allow students to create and use cue cards to help them recall the sine law and the cosine law

ESL–encourage students to use a translator to ensure that they understand the meaning of the words being used and the context

Ongoing Assessment

- Upon completing the Chapter 4 Review, students can also answer questions such as the following:
  - What questions did you find easy? Difficult? Why?
  - How often did you have to check the related worked example in the textbook to help you with the questions? For which questions?

Using the Chapter Review

- This Chapter Review is organized by sections and is designed to review different skills and concepts in this chapter.
- Review the different trigonometric ratios, the sine law and the cosine law. Discuss when it is appropriate to use each method.
- Students might work independently to complete the Review, then in pairs to compare solutions.
- Alternatively, the Review could be assigned for reinforcing skills and concepts in preparation for the Practice Test.
- After students have completed this Chapter Review, encourage them to make a list of questions that caused them difficulty, and include the related sections and teaching examples. They can use this to focus their studying for a final test on the chapter's content.
- Use **BLM 4–11 Chapter 4 Review** for extra review.

Chapter 4 Problem Wrap-Up

Student Text Page
223

Suggested Timing
40 min

Related Resources
- BLM 4–12 Chapter 4 Problem Wrap-Up Rubric

Summative Assessment
- Use **BLM 4–12 Chapter 4 Problem Wrap-Up Rubric** to assess student achievement.

Using the Chapter Problem

- Introduce the problem by discussing the situation and making sure students understand how the total station tracks the distance the discus was thrown. Students should work on this problem individually, as you will be evaluating their skills, understanding, and application of the sine and cosine laws. Encourage students to provide a highly detailed description of how to overcome the problem posed in part c).

Level 3 Notes

- Student demonstrates understanding of the sine law and the cosine law.
- Student demonstrates understanding of problem solving techniques.
- Student uses mathematical language effectively.
- Student's solution is clearly organized and choices are justified.
- Student's solution may contain minor errors.

Level 3 Sample Response

a) Solve for the distance from the centre of the throwing circle to each landing point, then compare the distances.

Igor's throw:

$D_I^2 = 20^2 + 72.3^2 - 2(20)(72.3)\cos 75°$

$D_I^2 = 4878.785\ldots$

$D_I \doteq 69.85$ m

Ralph's throw:

$D_R^2 = 20^2 + 69.1^2 - 2\,(20)\,(69.1)\cos 84°$

$D_R^2 = 4885.893\ldots$

$D_R \doteq 69.90$ m

Ralph threw his discus approximately 5 cm farther.

b) Given that D is in the same direction, the angle between D and the fixed distance of 20 m remains the same. For an official throw of 71 m, the value for D must be 72.5 m. Solve for the angle at the throwing circle for Igor's first throw. Then, use this angle to solve for the new distance, C, from the throw station and determine the angle for the second throw.

Let β represent the measure of the angle at the throwing circle.

By the cosine law:

$$\cos\beta = \frac{20^2 + 69.85^2 - 72.3^2}{2(20)(69.85)}$$

$\beta \doteq \cos^{-1}(0.0185\ldots)$

$\beta \doteq 88.939°$

By the cosine law.

$C^2 = 20^2 + 72.5^2 - 2(20)(72.5)\cos 88.939°$

$C^2 = 5602.551\ldots$

$C \doteq 74.85$ m

By the sine law.

$$\frac{\sin\theta}{72.5} = \frac{\sin 88.939°}{74.85}$$

$$\sin\theta = \frac{72.5\sin 88.939°}{74.85}$$

$$\angle\theta = \sin^{-1}\left(\frac{72.5\sin 88.939°}{74.85}\right)$$

If the second throw were in the same direction, it would require an angle of approximately 75.6° to achieve an official throw distance of 71 m.

c) Assume the distance C is the actual straight-line distance from the instrument to the landing point and find the actual distance measured along the ground from the total station to the landing point. To do this you need to know the height of the tripod. Use the Pythagorean theorem to solve for the distance along the ground. The distances calculated will likely be slightly overestimated.

What Distinguishes Level 2

- Student demonstrates some understanding of the sine law and the cosine law.
- Student demonstrates some understanding of problem solving techniques.
- Student uses mathematical language somewhat effectively.
- Student's solution is somewhat organized and choices are partially or ineffectively justified.
- Student's solution contains some significant errors.

What Distinguishes Level 4

- Student demonstrates thorough understanding of the sine law and the cosine law.
- Student demonstrates thorough understanding of problem solving techniques.
- Student uses mathematical language very effectively.
- Student's solution is highly organized and choices are clearly justified.
- Student's solution contains very few or no errors.