Task Trigonometry and Careers

Strand
Geometry and Trigonometry

Student Text Page
136

Suggested Timing
80 min

Tools
- computers with Internet access
- scientific calculators

Related Resources
BLM 2-17 Chapter 2 Task Rubric

Accommodations

Language—allow students to work with a partner. Have them provide some responses orally to check for comprehension.

Motor—allow students extra time. Assist students with recording calculations.

Specific Expectations

Solving Problems Involving Trigonometry

GT3.05 gather, interpret, and describe information about applications of trigonometry in occupations, and about college programs that explore these applications

Teaching Suggestions

- Have students read the Task and ensure they understand what they are being asked to do.
- Have students work in groups to brainstorm strategies for completing the Task. Discuss the strategies and review necessary skills and concepts for completing the problem.
- Review the requirements for writing a report.
- Students will need computers with Internet access for their research.
- Circulate as students complete the Task and assist them as necessary.

Prompts for Getting Started

Ask students the following questions:

- What is the Task asking you to do?
- How many careers do you need to investigate in detail?
- Where can you find information on careers and college programs?
- What are the requirements for a complete report?

Hints for Evaluating a Response

Student responses are being assessed for the level of mathematical understanding they represent. As you assess each response, consider the following questions:

- How much assistance did the student need to understand what information was required?
- How much assistance did the student need to find career and education information?
- Did the student demonstrate a knowledge of trigonometry as it applies to the selected careers?
- How much assistance did the student need to complete the Task?
- What parts of the Task did the student complete or not complete?
- Did the student present work that is clear and easy to follow and understand?
- Are the student's answers supported by references to Internet sources used?

Level 3 Sample Response

1. Land Surveyors need to calculate distances and angles to inaccessible points, such as high cliffs or over water. In the past, they performed these complex trigonometric calculations on paper or using a calculator. More recently, they use intricate computer equipment, which does the calculations for them. It is important for them to know how to operate the equipment correctly to avoid making errors.
2. Three additional careers that use trigonometry are Cartographer, Drafter, and Survey Engineering Technician.
3. I choose Survey Engineering Technician. Only Loyalist College in Belleville, Ontario offers a two-year college diploma program for this career. Go to *http://www.loyalistcollege.com/programs-and-courses/full-time-programs/survey-engineering-technician* for more information about the program.

First year courses:

Semester One

BLDG 1005 Building Methods & Materials: About building construction materials and methods.

CADD 1004 CAD 1: Introduction to AutoCAD software.

COMM 1002 Technical Communications 1: Presenting written technical information to clients.

MATH 1012 Mathematics 1: Algebra, geometry, and trigonometry (required for Engineering courses).

SURV 1000 Geomatics 1: Introduction to surveying.

SURV 1002 Field Work 1: Introduction to surveying field-work.

Semester Two

BLDG 1004 Heavy Construction, Methods and Materials: About materials and methods used in heavy construction. Prerequisite: BLDG 1005.

CADD 1005 CAD 2: More about AutoCAD software. Prerequisite: CADD 1004.

COMP 1003 Computer Applications 1: Introduction to Microsoft Office software.

MATH 1007 Mathematics 2: Continuation of Mathematics 1. Prerequisite: MATH 1012.

SURV 1001 Geomatics 2: More about surveying. Prerequisites: MATH 1012 & SURV 1000.

SURV 1004 Town Planning: About Ontario planning acts and regulations, and survey requirements for subdivisions.

SURV 2002 Legal Surveying 1: About real estate transactions and title searching in Ontario.

Level 3 Notes

Look for the following:

- a detailed description of how trigonometry is used in one career is given
- three additional careers that use trigonometry are chosen
- required first year courses for a specific program are listed with brief descriptions
- report is logically organized and clearly presented
- sources for additional information are listed
- use of mathematical language relating to trigonometry is effective

What Distinguishes Level 2

Look for the following:

- a brief description of how trigonometry is used in one career is given
- three additional careers are chosen but the connection to trigonometry is not clear
- required first year courses are listed for a general area and not for a specific program
- report lacks logical organization somewhat; some statements may be confusing
- few or no sources for additional information are listed
- use of mathematical language relating to trigonometry is somewhat effective

What Distinguishes Level 4

Look for the following:

- a very detailed description of how trigonometry is used in one career is given
- three or more additional careers are chosen with the connection to trigonometry clearly explained using examples

- required first year courses for a specific program are listed with detailed descriptions, particularly for courses involving mathematics and data management
- report is logically organized and very clearly presented with written and visual forms
- many sources for additional information are listed
- use of mathematical language relating to trigonometry is highly effective

Summative Assessment

- Use **BLM 2-17 Chapter 2 Task Rubric** to assess student achievement.

College Preparation Test Answers (page 137)

1. D
2. A
3. C
4. D
5. B
6. A
7. D
8. C
9. A
10. A
11. \$169.90
12. 7104 ft^3
13. 2.69 m^2
14. $\sin B = 0.822$, $\cos B = 0.570$, $\tan A = 0.694$
15. 0.562
16. 3071 m
17. 13.1 m