Chapter Problem Wrap-Up

Student Text Page
71

Suggested Timing
15–30 min

Tools
- grid paper
- graphing calculator
- computer with Internet access

Related Resources
- G–1 Grid Paper
- BLM 1–11 Chapter 1 Problem Wrap-Up Rubric

Summative Assessment
- Use **BLM 1–11 Chapter 1 Problem Wrap-Up Rubric** to assess student achievement.

Using the Chapter Problem Wrap-Up

- Part A of the Chapter Problem Wrap-Up involves a calculation based on concepts covered in Section 1.7. Have students solve the intersection using pencil and paper, and then display the two functions on a graphing calculator to check their answer to part a) before they answer part b).
- Students should keep track of their solutions to the Chapter Problem questions. Discuss how these relate to the Chapter Problem Wrap-Up.
- In Part B, allow students time to conduct an investigation on the actuarial science programs offered at universities and the jobs that actuaries perform. If time permits, students can create a project report on their findings.

Level 3 Sample Response

Part A

a) When both investments are worth the same amount,

$10t^2 - 48t + 5000 = 10\,000 + 497t$.

$10t^2 - 48t + 5000 = 10\,000 + 497t$

$10t^2 - 545t - 5000 = 0$

$5(2t^2 - 109t - 1000) = 0$

$2t^2 - 109t - 1000 = 0$

$(2t - 125)(t + 8) = 0$

$2t - 125 = 0$ or $t + 8 = 0$

$t = 62.5$ or $t = -8$

Since $t \geq 0$, the negative value is inadmissible.

Therefore, the two investments will be worth the same amount after 62.5 weeks.

b) Andrea should recommend investment 1 if the investor has more than 62.5 weeks available to have the investment grow.

Part B

Answers will vary.

Level 3 Notes

Look for the following:

- In Part A, demonstrates an understanding of how to solve a linear-quadratic system
- Solves the linear-quadratic system by factoring (some may solve using the quadratic formula)
- Shows a clear step-by-step progression from question to answer.
- Checks the solution using technology or another method
- Understands that the answer for t is in weeks
- In Part B, covers all of the basic areas outlined in the sample response, which includes high school courses, university information, exams that must be written for accreditation, as well as job prospects and salary expectations
- Presents the information in a clear and logical form, with proper spelling, grammar, and punctuation

What Distinguishes Level 2

- In Part A, shows some understanding of the format of a proper solution
- Lacks a clearly organized solution
- Uses the quadratic formula instead of trying to factor first
- Does not check the solution using a graphing calculator or similar technology
- Interprets the answer as an answer in years, without checking the units given in the question
- In Part B, covers some of the major aspects of the profession, with information missing on some aspects
- Report lacks detail in describing the major aspects of the profession
- Spelling, grammar, and punctuation show some errors
- Report leaves the reader with a general lack of interest in the profession

What Distinguishes Level 4

- In Part A, solution is highly organized and progresses logically
- Uses proper format throughout the solution
- Uses either factoring, the quadratic formula, or technology to solve for t
- Checks the solution using two of factoring, the quadratic formula, and technology (two that are not used to solve the equation)
- Correctly interprets the solution for t in weeks
- In Part B, provides considerable detail on each aspect of the profession
- Report includes such things as information obtained in conversation with a university registrar and/or an actuary
- Goes beyond the aspects of the profession that are required in the report
- Includes actual names of businesses and institutions that require the services of an actuary
- Report leaves the reader with a sense of interest in the profession