1.7 Focus on Reflecting

Mathematical Process Expectations Emphasis

- ☑ Problem Solving
- ☑ Reasoning and Proving
- ☑ Reflecting
- ☑ Selecting Tools and Computational Strategies
- ☑ Connecting
- ☑ Representing
- ☑ Communicating

Specific Expectations

Manipulating Expressions and Solving Equations
NA2.01 simplify numerical expressions involving integers and rational numbers, with and without the use of technology;
NA2.02 solve problems requiring the manipulation of expressions arising from applications of percent, ratio, rate, and proportion.

Warm-Up

1. One quarter of 8 is increased by 5 then doubled. What is the result?

2. Multiply 6 by -3, then square it. What is the result?

3. What is the sum of the squares of 4 and 7?

4. What are all the divisors of 24? 60? 17?

5. Calculate the area of a rectangle with width of 10 cm and length that is twice the width.

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Warm-Up Answers

1. 14

2. 324

3. 65

4. 24: 1, 2, 3, 4, 6, 8, 12, 24
60: 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60
17: 1, 17

5. 200 cm^2

Teaching Suggestions

- In this chapter, we have stressed mathematical processes and the importance of selecting the appropriate strategies. The final step in any solution is reflecting. Students need to be able to reflect on their final answer as well as on their strategy and make adjustments if necessary.
- Have students work through Investigate A with a partner. It is important that they be given a chance to reflect on their results and to explain them. (20 min)
- Have students work individually and then compare their strategies with a partner. You may wish to use **BLM A11 Group Work Assessment Recording Sheet** and/or **BLM A12 Group Work Assessment General Scoring Rubric** to assist you in assessing your students. (10 min)
- Encourage students to reflect on and evaluate their strategies.
- Assign and discuss the questions in Communicate Your Understanding. (20 min)
- Assign and take up Practise questions 1 and 2. Have students reflect on their solutions. (10 min)
- You may wish to use **BLM 1.7.1 Practice: Focus on Reflecting** for remediation or extra practice.

Investigate Answers (page 34)

A. 2. Answers will vary. The line continued all the way around, dividing the strip in half and eventually meeting back at the starting point. It went on both sides of the original paper.

3. Answers will vary. A sample answer: I would end up with two thinner Möbius strips.

4. Answers will vary. A sample answer: When cut along the centre, the Möbius strip became one larger Möbius strip with the strip completely twisted twice.

6. After cutting along the two lines, the Möbius strip turned into one larger Möbius strip like before, but there was a smaller Möbius strip going through it. The smaller strip was the centre of the original Möbius strip.

B. 1. Answers will vary. Sample answers: Write out the multiples of 7 until you go past 100. Or divide 100 by 7 and that is how many times 7 goes into 100.

2. The multiples of 7 are:

7	14	21	28	35	42	49	56	63	70	77	84	91	98

There are 14 in all. Notice that $100 \div 7$ is 14 R2.

3. Answers will vary. A sample answer: Dividing 100 by 7 was a faster solution, and would be more effective for larger problems.

Communicate Your Understanding Responses (page 35)

C1. a) He might try $5 + 7 + 9 + 11 + 13$ because he needs more than 35.
  b) No. There are many odd numbers and the question does not specify that they should be consecutive odd numbers.

C2. If it is a right triangle, then the Pythagorean theorem will work, and $3^2 + 5^2$ should equal 7^2. Since $3^2 + 5^2 = 34$ and not 49, it is not a right triangle.

C3. a) The attendant should have done some mental arithmetic to estimate the sum of the two prices.
  b) The attendant might have entered the wrong item into the cash register, or entered too many items.

Practise

These questions are straightforward. Encourage students to reflect on their answers and strategies.

Connect and Apply

For all of these questions, encourage a class discussion on methods and final answers.

Question 6 allows students to use a variety of strategies. Have students compare strategies with their classmates.

Question 7 stresses verification of the student's rule.

Question 10 stresses error analysis, a skill students need when reflecting on solutions. You may wish to use **BLM A9 Communication General Scoring Rubric** to assist you in assessing your students.

Extend

Question 11 is a Fermi problem that may require some research, or educated guesses, into pizza sales.

The solutions to the magic squares in question 12 are relatively straightforward. The discussion of strategies is the key.

Literacy Connections

Think It Through

Ask students, *What is your style for solving a problem?* Encourage students to discuss their style with a classmate. Explain that writing as if in a diary may help them reflect on the problem solving they have done.

Exercise Guide

Category	Question Number
Minimum (essential questions for all students to cover the expectations)	1–5, 10
Typical	1–10
Extension	11, 12