Arithmetic Sequences Exercise (Section 2.1)   NAMES:

Turn in one paper per group but be sure all members of the group have seen the final answers. Circle your name if the paper that gets turned in is your copy.

Part I: The following is an exploration based on selected questions from Set I of the exercise set.

1. Assume the following sequences (with missing terms) are arithmetic sequences. Find the missing terms. These are exercises 23-27 from Set I.

10, ☐ , 70

10, ☐ , ☐ , 70

10, ☐ , ☐ , ☐ , 70

10, ☐ , ☐ , ☐ , ☐ , 70

10, ☐ , ☐ , ☐ , ☐ , ☐ , 70

2. Explain how you went about finding the missing terms in the above sequences.

3. Make up an arithmetic sequence that has a **negative** common difference. Write down at least six terms in your sequence. What is the common difference?

Part II: The following is an exploration **based on** questions from Set II of the exercise set.

Consider the following arithmetic sequence. We will investigate how we may find the 100th term without writing all of the terms down. We will need to explore the pattern of the sequence.

$$2 \quad 5 \quad 8 \quad 11 \quad 14 \quad 17 \quad \dots$$

1. What is the common difference in this sequence?
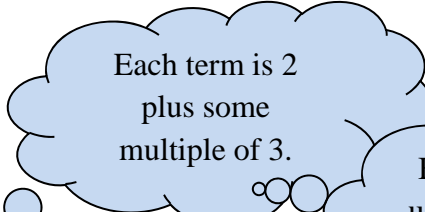
2. Let's call the sequence's terms $t_1, t_2, t_3, \dots, t_n$ as described in the book. We could then write the following.
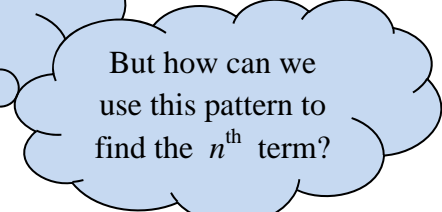
$t_1 = 2$

$t_2 = 2 + 3 \cdot 1 = 5$

$t_3 = 2 + 3 \cdot 2 = 8$

$t_4 = 2 + 3 \cdot 3 = 11$

Each term is 2 plus some multiple of 3.

But how can we use this pattern to find the nth term?

3. Write similar equations for the fifth and sixth terms. Use the notations t_5 and t_6 in your equations.

4. Write the equation for the nth term.

5. Find the 100th term using your equation.

Consider this new arithmetic sequence.

50   45   40   35   30   …

6. What is the common difference?

7. Use the form shown on page 2 to write equations for the first five terms, t_1, t_2, t_3, t_4, and t_5.

8. Write the equation for the nth term.

9. Find the 12th term using your equation.

10. Check your answer by finding the 12th term by writing down all the terms of the sequence until you get to it.