

Algebra 1

chapter

1

Section 1.7 Algebraic patterns, an introduction

PROJECT MATHS
Text & Tests 6

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Example 1

Examine each of the following patterns of numbers and determine if there is a linear or quadratic relationship between the terms.

Write an algebraic expression for each set of numbers:

- (a) $-2, 1, 4, 7, \dots$ (b) $3, 5, 11, 21, \dots$

(a)	PATTERN 1st DIFFERENCE	$-2, 1, 4, 7$ $3, 3, 3$	Common difference = +3
	$T_2 - T_1$ etc..		THIS IS A LINEAR PATTERN BECAUSE THE 1st DIFFERENCE IS CONSTANT
(b)	PATTERN 1st DIFFERENCE 2nd DIFFERENCE	$3, 5, 11, 21$ $2, 6, 10$ $4, 4$	THIS IS A QUADRATIC PATTERN BECAUSE THE SECOND DIFFERENCE IS CONSTANT

Exercise 1.7

1. Examine each of the following patterns of numbers and determine if the pattern has a linear or quadratic relationship.

(a) 4, 7, 10, 13, 16, ...

(b) -2, 2, 6, 10, 14, ...

<p>What are the next 3 terms?</p> <p>If the 1st Difference is constant we have a LINEAR PATTERN</p>	<p>4, 7, 10, 13, 16, 19, 22, 25</p> <p>↖ ↗ ↖ ↗ ↖ ↗</p> <p>+3 +3 +3 +3 +3</p> <p>-2, 2, 6, 10, 14, 18, 22, 26</p> <p>↖ ↗ ↖ ↗ ↖ ↗ ↖ ↗</p> <p>+4 +4 +4 +4 +4 +4</p>
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1. Examine each of the following patterns of numbers and determine if the pattern has a linear or quadratic relationship.

(c) -4, -3, 0, 5, 12, ...

(d) 2, 1, -2, -7, -14, -23, ...

<p>(c) PATTERN</p> <p>1st DIFFERENCE</p> <p>2nd DIFFERENCE</p>	<p>-4, -3, 0, 5, 12,</p> <p>1, 3, 5, 7,</p> <p>2, 2, 2, 2,</p> <p>This is a <u>Quadratic</u> pattern because the <u>2nd</u> difference is constant.</p>
<p>(d) PATTERN</p> <p>1st DIFFERENCE</p> <p>2nd DIFFERENCE</p>	<p>2, 1, -2, -7, -14, -23,</p> <p>-1, -3, -5, -7, -9,</p> <p>-2, -2, -2, -2,</p> <p>This is a <u>Quadratic</u> pattern because the <u>2nd</u> difference is constant.</p>