Name: _____ ( ) Class: _____ Date: _____

Lesson Worksheet 7.2A(II)

Objective: To solve problems involving constant growth rates.

If a quantity grows at a constant rate of r% per *period*, then
若一個量在每個時期以固定的率 r% 增長，則

new value after n periods = original value × $(1 + r\%)^n$
n 期後的新值 = 原值 × $(1 + r\%)^n$

- r% is called the *growth rate*. r% 稱為增長率。
- $(1 + r\%)$ is called the *growth factor*. $(1 + r\%)$ 稱為增長因子。

1. Vivian is *170 cm* tall now and her height has *increased by 3.5%* every half year over the past *two years*. How tall was Vivian two years ago?
(*Give the answer correct to the nearest cm.*)

Let x cm be the height of Vivian two years ago.

$x(1 + $ 3.5% $)^{(}$ 4 $^{)} =$ 170

$1.035^4x = 170$

$x =$ 148, *corr. to the nearest integer*

∴ Vivian was 148 cm tall two years ago.

Demonstration

Jacky weighs 130 lb now. His weight has increased by 2% every half year over the past three years. Find the weight of Jacky three years ago.
(*Give the answer correct to the nearest lb.*)

Solution

Let x lb be the weight of Jacky three years ago.

$x(1 + 2\%)^6 = 130$ ◄ 3 years means 6 half years
$1.02^6x = 130$
$x = 115$, *cor. to the nearest integer*

2. The present monthly salary of Cathy is *$28 500*. Over the past *three years*, her monthly salary has increased at a constant rate of *4.5%* per year. Find the monthly salary of Cathy three years ago.
(*Give the answer correct to the nearest hundred dollars.*)
Let $\$x$ be the monthly salary of Cathy three years ago.

$x(1 + $ 4.5% $)^{(}$ 3 $^{)} =$ 28500

$1.045^3x = 28\,500$

$x =$ 25000, *corr. to the nearest hundred*

∴ The monthly salary of Cathy was $ 25000 three years ago.

Set up an equation to find the monthly salary of Cathy three years ago.

increase(增加) decrease(減少) period(時期) growth rate(增長率) growth factor(增長因子)