S3 Mathematics

Pre-lesson Worksheet: Percentages 2

Name：_____ Class：_____ ( )

Date:

Marks: /10

A. More about Percentage Changes

Key Points: Percentage Changes

- Percentage change = $\dfrac{\text{new value} - \text{original value}}{\text{original value}} \times 100\%$
- New value = original value × (1 + percentage change)

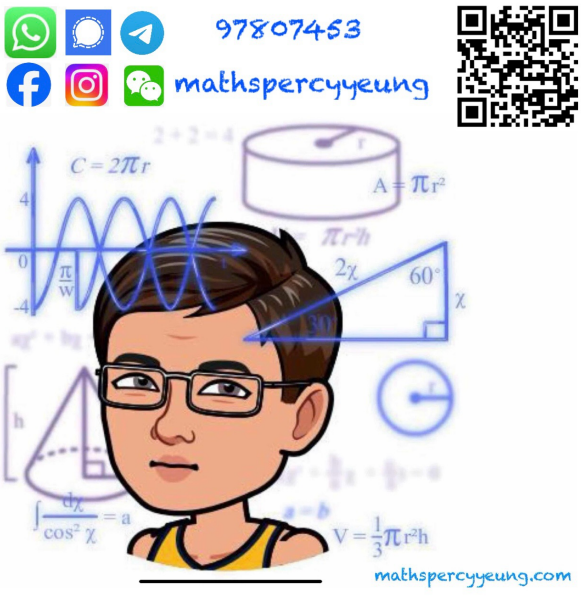
Quick Review

1. The weight of Natalie was 66 kg last month. Her weight decreases by 5% this month. Find the weight of Natalie this month.

2. The amount of savings of Tony was \$252 000 in 2020, which was 5% more than that in 2019.

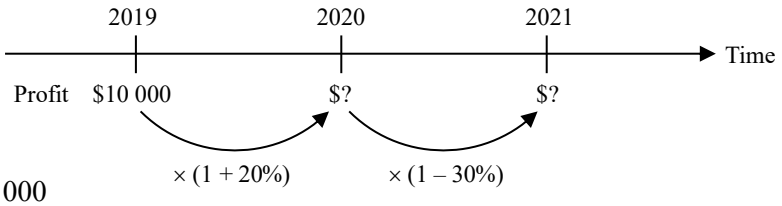
(a) Find the amount of savings of Tony in 2019.

(b) If the amount of savings of Tony decreased by \$23 400 in 2021, find the percentage change in the amount of Tony from 2019 to 2021.



Key Points: Successive Percentage Changes

E.g. It is given that the profit of a company was \$10 000 in 2019. The profit was increased by 20% in 2020 and then decreased by 30% in 2021.



Profit in 2019 = \$10 000

Profit in 2020 = \$10 000 **× (1 + 20%)**

Profit in 2021 = \$10 000 × (1 + 20%) **× (1 – 30%)**

Let's Try

1. The number of visitors to an exhibition was 25 000 in January. The number of visitors increased by 10% in February, but decreased by 6% in March, and further decreased by 4% in April. Find the number of visitors in April.

2. The weight of a baby was 5 kg at the beginning of June. His weight increased by 4% at the beginning of July and then increased by 5% at the beginning of August.

(a) Find the weight of the baby at the beginning of August.

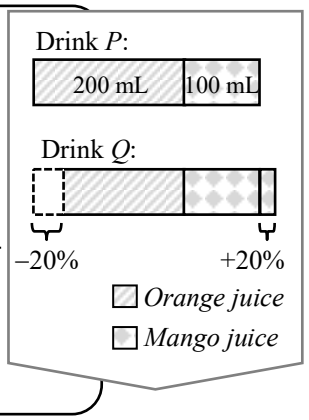
(b) Find the percentage change in the weight of the baby from the beginning of June to the beginning of August.

Key Points: Component Percentage Changes

When we handle situations involving component percentage changes, we have to calculate **the change in each part separately** and then combine the parts to find the required value(s).

E.g. Drink *P* is prepared by mixing 200 mL of orange juice and 100 mL of mango juice. Drink *Q* is prepared by decreasing the volume of orange juice by 20% and increasing the volume of mango juice by 20% in drink *P*.

		Drink *P*		Drink *Q*
①	Orange juice	200 mL	−20% →	? mL
②	Mango juice	100 mL	+20% →	? mL
	Total volume:	200 mL + 100 mL		? mL



∴ Volume of drink *Q* = [200 × (1 − 20%) + 100 × (1 + 20%)] mL

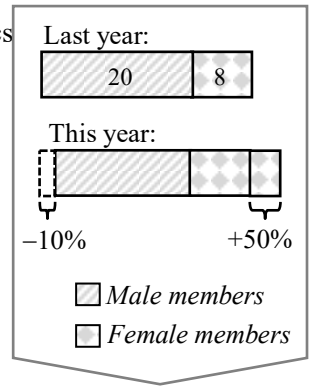
(200 × (1 − 20%): Volume of orange juice; 100 × (1 + 20%): Volume of mango juice)

= (200 × 0.8 + 100 × 1.2) mL

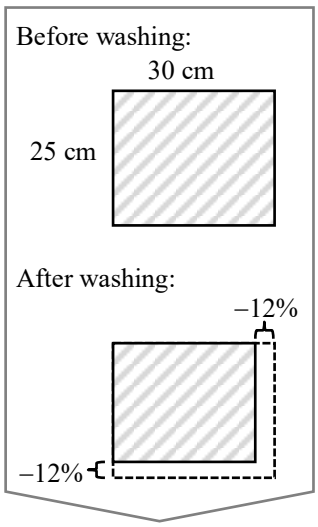
= 280 mL

Let's Try

1. Last year, there were 20 male members and 8 female members in the mathematics club. This year, the number of male members decreased by 10% and the number of female members increased by 50%. Find the total number of members in the mathematics club this year.



2. The length and the width of a rectangular handkerchief are 30 cm and 25 cm respectively. After washing, the length and the width of the handkerchief both reduce by 12%. Find the area of the handkerchief after washing.



B. Simple Interest

Please watch the following video (https://www.youtube.com/watch?v=fqDOKz2m5rY) for pre-lesson study. After that, complete P.4.

Date:

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Key Points: Simple Interest

When a principal $\$P$ is deposited at an interest rate r% per period for t periods,

the **simple interest** earned $\$I$ can be calculated by: $\boldsymbol{I = P \times r\% \times t}$

The sum of the principal and the interest is called the **amount**.

The amount $\$A$ can be calculated by: $\boldsymbol{A = P + I}$ or $\boldsymbol{A = P \times (1 + r\% \times t)}$

e.g. Principal = \$1000, interest rate = 5% per annum, number of periods = 3 years

(per = year)

Interest = $1000 × 5% × 3

= $150

Amount = $(1000 + 150)

= $1150

◀ *Alterative Solution*

Amount = $1000 × (1 + 5% × 3)

= $1150

Let's Try

Complete the following table. **(1 – 4)**

	Principal	Interest rate	Period	Simple interest	Amount
1.	\$60 000	3% p.a.	4 years		
2.	\$120 000	2.5% p.a.	5 years		
3.	\$8000	2.4% p.a.	1.5 years		
4.	\$30 000	3.6% p.a.	0.5 years		