# The Panda Math Tutor

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# Money: Earning, Borrowing, Investing & Trade

IGCSE Mathematics

The Panda Math Tutor

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# 1 Introduction

**Note**

Financial mathematics is one of the most practical areas of the IGCSE course. The skills you build here — working with percentages, applying interest formulas, and comparing costs — are directly relevant to everyday decisions about money.
**This chapter covers the following topics:**

- Understanding how wages, salaries, overtime, and commission are calculated
- The difference between gross pay and net pay, and how deductions work
- The percentage toolkit: calculating percentages, finding percentage change, using multipliers, and reversing a percentage
- Simple interest: a fixed charge on the original sum
- Compound interest: interest that accumulates on itself over time
- Repeated percentage change applied to growth, depreciation, and decay
- The true cost of borrowing: loans, APR, hire purchase, and credit
- Buying and selling: profit, loss, percentage profit, discount, and VAT
- Best-buy analysis: comparing value across different pack sizes or deals
- Foreign currency exchange, including the effect of commission charges

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# 2 Earning Money

## 2.1 Key Vocabulary

**Definition**

The terms below describe the different ways in which income is earned and recorded:

- **Gross Pay:** The full amount of money earned over a pay period, *before* any money is deducted. Gross pay is what an employer commits to paying.
- **Net Pay:** The amount of money a worker actually receives into their bank account, *after* all compulsory and voluntary deductions have been removed. Also called take-home pay.
- **Wage:** An income structure where the worker is paid a set amount *for each*

*hour* they work. The total weekly or monthly wage varies depending on hours worked.

- **Salary:** A fixed total sum agreed for a full year's work, paid out in equal instalments (typically 12 monthly payments regardless of the number of days in each month).
- **Overtime:** Hours worked in addition to the standard contracted hours. Employers usually pay a higher rate for these hours as compensation.
- **Commission:** An earnings structure, or a supplementary bonus, linked directly to the value of sales a worker generates — typically paid as a percentage of those sales.
- **Deductions:** Money removed from gross pay before it reaches the worker. The three main categories are income tax, National Insurance contributions, and pension payments.
- **Bonus:** A one-off or periodic payment given on top of standard pay, often linked to individual or company performance.

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## 2.2 Wages and Overtime

**Key Formula**

$$\text{Basic Wage} = \text{Hourly Rate} \times \text{Number of Hours Worked}$$

$$\text{Overtime Pay} = \text{Overtime Hourly Rate} \times \text{Number of Overtime Hours}$$

$$\text{Gross Pay} = \text{Basic Wage} + \text{Overtime Pay} + \text{Commission} + \text{Bonus}$$

$$\text{Net Pay} = \text{Gross Pay} - \text{Total Deductions}$$

**Note**

**Standard overtime rate conventions:**

- **Time-and-a-half:** Each overtime hour pays 1.5× the normal hourly rate.
- **Double time:** Each overtime hour pays 2× the normal hourly rate.

For instance, a standard rate of £12.40/h gives a time-and-a-half rate of £12.40 × 1.5 = £18.60/h.

# Preview ends here

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