



# Goods and Services Tax (GST)

Year 11 General Maths  
Units 1 and 2

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## Learning Objectives

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By the end of the lesson I would hope that you have an understanding and be able to apply to questions the following concepts:

- Be able to understand what GST is
- Be able to calculate GST
- Be able to find the cost of items that include GST
- Be able to find the cost of items prior to GST being added



## Recap

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In the past two lessons we have been looking at percentages. How to find them, how to convert various things so they become percentages and how to find percentage increase and decrease.

This might seem like fairly easy stuff, but it will get more complex as the course progresses. But it's always nice to start with simple things.

This lesson will look at what GST is and how to find it.



## There are only two things which are certain in life ...

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There is a well known saying which says that there are only two things which are certain in life. These being:



Terribly depressing really. Makes you wonder why you work so hard ...

Taxes help pay for things like schools, hospitals, police, fire services, roads etc.



## How does the government collect tax?

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Lots of things are taxed:

- Salary
- Properties (when you buy them)
- Fuel for your car
- Most of the things you buy

Good and Services Tax is added onto pretty much everything you buy.

The amount varies between countries. At the moment, in the UK it is 17.5%.

In Australia it is 10%.

In Singapore it's only 7%.



## Finding how much GST should be added to a product

Australia has made finding GST really easy. As it is currently 10%, it means that we find 10% of the original price and then add it on.

We know that 10% of a number can be found by:

$$\frac{10}{100} \times \text{the number}$$

Or, more simply:

$$\text{GST} = \frac{1}{10} \times \text{the number}$$

\$300

$$10\% \text{ of } \underline{300} = \underline{\underline{30}}$$
$$\frac{10}{100} \times \underline{300}$$
$$\frac{1}{10} \times \underline{300}$$



### Example: Calculating the amount of GST

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If the cost of electricity in one quarter is \$288.50, how much GST will be added?

**Remember:** As this is a CAS enabled course, we can use the CAS to help us, but it's always a good idea to write out what you are going to put into the CAS for your exams and tests.

$$\frac{1}{10} \times 288.50 = \underline{\underline{\$28.85}}$$



### Example: Calculating the amount of GST

The bill for the services that a plumber provides is \$650. GST needs to be added. What is the amount of the final bill with GST included?

$$\text{GST} = \frac{1}{10} \times 650 = \underline{\underline{65}}$$

$$\begin{aligned}\therefore \text{Final} &= 650 + 65 \\ &= \underline{\underline{\$715}}\end{aligned}$$

$$\begin{aligned}650 &= 100\% \\ &= 110\%\end{aligned}$$

$$\begin{aligned}&110\% \text{ of } 650 \\ &= \boxed{\frac{110}{100}} \times 650 \\ &= \underline{\underline{\$715}}\end{aligned}$$





## Finding the cost BEFORE GST was added

Just like Mathematics to want to do things both forwards and backwards!

To try and make it confusing, they will ask you to find the original price before the GST was added.

This is pretty easy when we use the following formula:

$$\text{cost without GST} = \frac{\text{cost with GST}}{1.1}$$

$$110\% \text{ of } \underline{\hspace{2cm}} =$$

$$\frac{110}{100}$$

$$\boxed{1.1} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$



## Finding the cost BEFORE GST was added .... The why!

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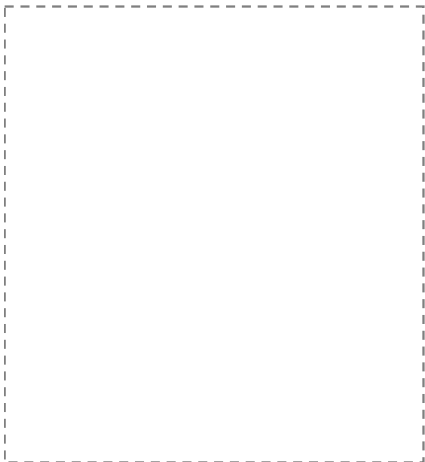
We know, from the work we did with percentage increase and decrease that when something has been increased by 10% we can multiply the amount by 1.1 to find the final price (including the increase).

So, we can find the new price including GST by using:

$$\text{New price with GST} = \text{Old price} \times 1.1$$



This can then be rearranged to give the formula we saw on the last slide.



### Example: Finding the cost BEFORE GST was added

An electric guitar costs \$2299 including GST. What is the price without GST?

$$\text{Price} = \frac{2299}{1.1} = \$\underline{\underline{2090}}$$

Inc GST      Before GST

$$2299 - 2090$$



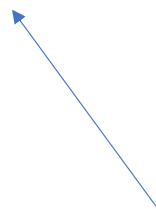
## Finding how much GST was added

I know that lots of textbooks will ask you to add even more formulae to help you find how much GST was added to an item. For example, the Cambridge textbook uses the following:

$$\text{Amount of GST} = \frac{\text{cost without GST}}{10} \quad \text{and} \quad \text{Amount of GST} = \frac{\text{cost with GST}}{11}$$

I prefer to use a simpler approach:

$$\text{Amount of GST added} = \text{Price with GST} - \text{Price before GST}$$



We already know how to do this, so why make things more complex?!



### Example: Finding how much GST has been added

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A desktop computer sells for \$935, **including GST**. What is the amount of GST that has been added?

$$\text{Price Before} = \frac{935}{1.1} = \underline{\underline{850}}$$

$$\begin{aligned}\therefore \text{GST} &= 935 - 850 \\ &= \underline{\underline{\$85}}\end{aligned}$$

