

5.4

Sales Tax and Discount

Focus Investigate the use of percent in consumer math.

A sales tax is charged by the federal government and by most provincial governments. In 2007, the federal tax, the goods and services tax (GST), was 6%.

The provincial sales tax (PST) is set by each provincial or territorial government.

Some provinces have introduced a harmonized sales tax (HST), which combines both the PST and GST.

Province or Territory	Provincial Sales Tax	Goods and Services Tax
Northwest Territories (NT)	no PST	6%
Nunavut (NU)	no PST	6%
Yukon (YT)	no PST	6%
British Columbia (BC)	7%	6%
Alberta (AB)	no PST	6%
Saskatchewan (SK)	5%	6%
Manitoba (MB)	7%	6%
Ontario (ON)	8%	6%
Québec (QC)	7.5%	6%
Newfoundland and Labrador (NL)	14% HST	
Nova Scotia (NS)	14% HST	
New Brunswick (NB)	14% HST	
Prince Edward Island (PEI)	10%	6%

Investigate

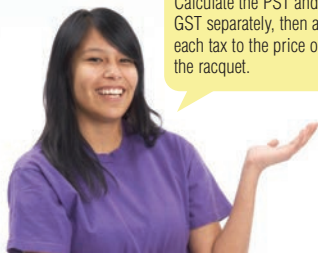
Work with a partner.

Celine wants to purchase a tennis racquet in Winnipeg, Manitoba.

The racquet sells for \$129.99.

To ensure she has enough money, Celine wants to calculate the final price of the racquet, including all taxes. She asks 3 friends for help.

Helen says:



Calculate the PST and GST separately, then add each tax to the price of the racquet.

Zack says:



Find the total sales tax as a percent, calculate the tax, then add the tax to the price of the racquet.

William says:



Find 113% of the cost of the racquet to find the final price.

Use each method to calculate the final price of the racquet.

Reflect & Share

Compare your results with those of another pair of classmates. What do you notice? Why do you think this happens? Which of the three methods would you use? Justify your choice.

Connect

The selling price of an item is often the same throughout Canada. But the amount you pay depends on the province or territory where you buy the item.

Example 1

How much would you pay for this DVD in each place?

- a) Nunavut b) Saskatchewan c) Nova Scotia

A Solution

- a) In Nunavut, there is no PST.

The GST is 6%.

$$\begin{aligned} 6\% \text{ of } \$25.99 &= 0.06 \times \$25.99 \\ &\doteq \$1.56 \end{aligned}$$

So, the price you pay is: $\$25.99 + \$1.56 = \$27.55$

- b) In Saskatchewan, the PST is 5% and the GST is 6%.

$$\begin{aligned} \text{PST: } 5\% \text{ of } \$25.99 &= 0.05 \times \$25.99 \\ &\doteq \$1.30 \end{aligned}$$

$$\begin{aligned} \text{GST: } 6\% \text{ of } \$25.99 &= 0.06 \times \$25.99 \\ &\doteq \$1.56 \end{aligned}$$

So, the price you pay is: $\$25.99 + \$1.30 + \$1.56 = \28.85

- c) In Nova Scotia, the HST is 14%.

$$\begin{aligned} \text{HST: } 14\% \text{ of } \$25.99 &= 0.14 \times \$25.99 \\ &\doteq \$3.64 \end{aligned}$$

So, the price you pay is: $\$25.99 + \$3.64 = \$29.63$



When an item is on sale for 20% off, we say that there is a **discount** of 20%.

A discount of 20% on an item means that you pay:

$$100\% - 20\% = 80\% \text{ of the regular price}$$

Example 2

A video game in Vancouver is discounted by 30%.

Its regular price is \$27.99.

- Calculate the sale price of the video game before taxes.
- Calculate the sale price of the video game including taxes.

A Solution

- To find the amount of the discount, calculate 30% of \$27.99.

$$30\% = \frac{30}{100} = 0.3$$

$$\begin{aligned}\text{So, } 30\% \text{ of } \$27.99 &= 0.3 \times \$27.99 \\ &\doteq \$8.40\end{aligned}$$

The amount of the discount is \$8.40.

$$\text{So, the sale price of the video game is: } \$27.99 - \$8.40 = \$19.59$$

- In Vancouver, the PST is 7% and the GST is 6%.

Calculate the taxes.

The PST is 7%.

$$\begin{aligned}7\% \text{ of } \$19.59 &= 0.07 \times \$19.59 \\ &\doteq \$1.37\end{aligned}$$

The GST is 6%.

$$\begin{aligned}6\% \text{ of } \$19.59 &= 0.06 \times \$19.59 \\ &\doteq \$1.18\end{aligned}$$

$$\text{So, the sale price, including taxes, is: } \$19.59 + \$1.37 + \$1.18 = \$22.14$$

Example 2 Another Solution

- Find the sale price in one step.

The sale price of the video game is: $100\% - 30\%$, or 70% of \$27.99

$$\begin{aligned}70\% \text{ of } \$27.99 &= 0.7 \times \$27.99 \\ &= \$19.59\end{aligned}$$

So, the sale price of the video game is \$19.59.

- Find the sale price, including taxes, in one step.

The total sales tax is: $7\% + 6\% = 13\%$

\$19.59 is 100% of the sale price.

So, the sale price including taxes is $100\% + 13\%$, or 113% of \$19.59.

$$\begin{aligned}113\% \text{ of } \$19.59 &= 1.13 \times \$19.59 \\ &\doteq \$22.14\end{aligned}$$

So, the sale price, including taxes, is \$22.14.

Example 3

The cost price of a backpack is \$10.50.

This is 30% of the selling price.

- a) What is the selling price of the backpack?
- b) What does a customer pay for the backpack in Regina, Saskatchewan?

A Solution

- a) 30% of the selling price is \$10.50.

So, 1% of the selling price is: $\frac{\$10.50}{30}$

and 100% of the selling price is: $\frac{\$10.50}{30} \times 100 = 35$

The selling price of the backpack is \$35.00.

- b) The PST in Saskatchewan is 5%.

The GST is 6%.

So, the total sales tax is: $5\% + 6\% = 11\%$

So, the price you pay is 100% + 11%, or 111% of \$35.00.

$111\% \text{ of } \$35.00 = 1.11 \times \35.00

$= \$38.85$

A customer in Regina pays \$38.85 for the backpack.

Discuss the ideas

1. In *Example 1b*, the PST was calculated before the GST. Suppose these calculations were reversed. Do you think you would get the same answer? Explain.
2. In *Example 2*, the discount was calculated as \$8.397. Why was the answer given as \$8.40?
3. Suppose you bought a taxable item for \$50. How much would you pay for it in your province or territory? What strategy would you use to find out?

Practice

Use a calculator when you need to.

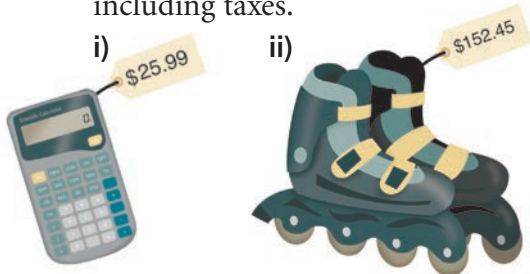
Check

4. Suppose you are in Flin Flon, Manitoba. Find the PST on each item.
 - a) a pair of sunglasses that cost \$15.00
 - b) a sunscreen that costs \$8.99
 - c) a laser mouse that costs \$21.99

5. Suppose you are in Fort Simpson, Northwest Territories. Find the GST on each item.
 - a) a digital camera that costs \$89.97
 - b) a cordless phone that costs \$24.97
 - c) a soccer ball that costs \$17.99

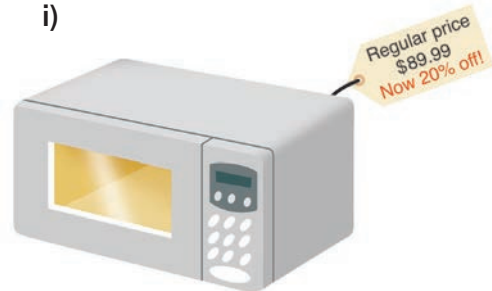
6. Suppose you are in Victoria, British Columbia. Find the sales taxes on each item.
 - a) a package of light bulbs that costs \$7.47
 - b) an inflatable raft that costs \$32.99
 - c) a diving mask that costs \$27.98

7. Suppose you are in Moose Jaw, Saskatchewan. For each item below:
 - a) Calculate the PST and GST.
 - b) Calculate the selling price including taxes.



Apply

8. Suppose you are in Iqaluit, Nunavut. For each item below:
 - a) Calculate the discount.
 - b) Calculate the sale price before taxes.
 - c) Calculate the sale price including taxes.



9. A new house was purchased for \$304 000. After 3 years, its market value had increased by 28%. What was the market value of the house after 3 years?
10. **Assessment Focus** A video store offers these choices.
Choice A: 30% off each DVD with regular price \$25.00
Choice B: Buy two DVDs for \$40.00.
Which is the better deal for the customer? Justify your answer.

- 11.** In a sale in Red Deer, Alberta, the price of a blow dryer is marked down.



- a) What is the percent decrease?
b) Calculate the sale price including taxes.
- 12.** At the end of the summer, a gift store in Vancouver reduced the price of a souvenir T-shirt. The regular price of the T-shirt was \$30. The T-shirt was reduced by 25%. The manager then put this sign in the window:



Rico told his mother that the T-shirt was now half its regular price. Was Rico correct? Justify your answer.

- 13.** During a 20%-off sale, the sale price of an MP3 alarm clock radio was \$35.96. What was the regular price of the radio?

- 14.** The regular price of a pair of snowshoes in Brandon, Manitoba, is \$129.99. The price of the snowshoes is marked down by 13%. Abbott says that the sale price including taxes will be \$129.99 because the discount and taxes cancel each other out. Is Abbott's reasoning correct? Justify your answer.



- 15.** The price of a hair straightener in Fredericton, New Brunswick, is reduced by \$28.38. This is a discount of 33%.
- a) What is the regular price of the hair straightener?
b) What is the sale price of the hair straightener including taxes?
- 16.** Anika wants to buy a snowboarding helmet. The original price is \$75.00. It is on sale for 30% off. Anika will pay 13% sales tax. A customer behind Anika in the line suggested that it would be cheaper if the 30% discount was subtracted before calculating the sales tax. Another customer said it would be cheaper if the 13% sales tax was added before the discount was subtracted. Who is correct? Show how you found out.

- 17. Take It Further** Two identical lacrosse sticks are on sale at two stores in Dawson City, Yukon. At Strictly Sports, the stick is on sale for 15% off its regular price of \$45.99. At Sport City, the stick is on sale for 20% off its regular price of \$49.99. Which store offers the better deal? How much would you save? Show your work.



- 18. Take It Further** For a promotion, a store offers to pay the sales taxes on any item you buy. You are actually paying taxes, but they are calculated on a lower price. Suppose you buy an item for \$100. The store pays the 14% sales tax.
- What is the true sale price of the item?
 - How much tax are you really paying?

- 19. Take It Further** A pair of shoes in a clearance store went through a series of reductions. The regular price was \$125. The shoes were first reduced by 20%. Three weeks later, the shoes were reduced by a further 20%. Later in the year, the shoes were advertised for sale at $\frac{3}{4}$ off the current price. Sean wants to buy the shoes. He has to pay 11% sales tax.
- Sean has \$40.00.
Can Sean buy the shoes?
How did you find out?
 - If your answer to part a is yes, how much change does Sean get?

- 20. Take It Further** A skateboard in a store in Charlottetown, PEI, costs \$39.99. It is on sale for 30% off. The taxes are 16%. What is the sale price of the skateboard including taxes? A student says, “\$39.99 – 30% discount + 16% taxes is the same as calculating \$39.99 – 14%.” Is the student’s reasoning correct? Explain.

Reflect

Describe two different methods to calculate the sales tax on an item.
Which method do you prefer?
Which method is more efficient?
Include an example using each method.