

# Income Tax

## Case Study: Ms. Bigshot

In contrast to everything else on FinStart, this case study is not age-appropriate. For the foreseeable future, most students will have little income and will most likely not pay any income tax. So a young person's case study would not be very instructive. Instead, we present Ms. Bigshot, who is in the highest tax bracket, has various sources of income that are treated differently for tax purposes, and uses two registered accounts, the TFSA and RRSP. That's a rich dataset to illustrate key points.

### No calculations required

Problem 1 in this case study is entirely qualitative. We have prepared Ms. Bigshot's income tax filing using a CRA-approved tax preparation software and ask students to answer questions by finding certain data points on it. There are two ways to do it:

1. Using a summary table within Problem 1.
2. Using real-life printouts of the tax forms from the software (in the Appendix to Problem 1).

### Calculations required

Problem 2 requires calculations and is a good example of how we are structuring math problems in this booklet:

- Those that require various calculations, sometimes multi-step.
- Those that can be represented as functions and then solved, graphed, etc.
- Those that are well-suited for building an Excel workbook or writing code (Python, Visual Basic, Java, etc.)

We thought that organizing questions in this way will make them easy to use in various levels of core math, data management, and other quantitative courses (perhaps economics), and even by certain clubs. We look forward to hearing what you think.

### Terminology

Terminology used in this case study is explained as follows:

- Income Tax <https://www.finstart.ca/income-tax.html>
- Registered accounts <https://www.finstart.ca/registered-accounts---investing.html>
- GICs <https://www.finstart.ca/gics.html>
- Investments <https://www.finstart.ca/investment-accounts.html>



## Teaching with FinStart

### Active learning module:

*Kay has just arrived from Mars for a summer internship on Earth. Upon inspecting her first paycheck, she notices...*

### How It Works video

**Talk Like a Banker** (word game)

### Take a FinStart Quiz

**Reference:** Income Tax pages

- Prepare
- Submit

<https://www.finstart.ca/income-tax.html>

A 6-minute video on the *For Teachers* page shares a number of ideas about teaching with FinStart.

## Case Study: Ms. Bigshot

Ms. Bigshot is a high-earning individual with tax residency in Ontario. She pays both Federal and Provincial income taxes. To prepare her tax return for 2019, she goes through seven steps outlined in the Federal Income Tax and Benefit Return form, also known as T1 General form, provided by Canadian Revenue Agency (CRA). The first step is “Identification and other information”. Steps 2-7 are listed in the table on the next page that we use for Problem 1.

When answering the questions in Problem 1, you can use either the table on the next page or Ms. Bigshot’s completed T1 General form, included in the Appendix.

- Ms. Bigshot earned salary of \$215,000 from her employer in 2019. From each paycheck the employer subtracted mandatory payroll deductions that add up to the following amounts for 2019:
  - \$70,000 of income tax deduction.
  - \$2,748.90 (the maximum allowed) contributions she made to Canada Pension Plan (i.e. CPP).
  - \$860.22 (the maximum allowed) premium she paid to Employment Insurance (i.e. EI).
- In addition, Ms. Bigshot received \$20,000 of interest income from her GIC investments and had a \$30,000 capital gain from selling her stocks (it’s called a ‘realized gain’ because the investment was sold).
- She made the maximum allowed RRSP contribution of \$27,320 and maximum allowed TFSA contribution of \$6,500 (those are registered accounts).
- She used net capital losses of \$2,000 from previous year to reduce her taxes for 2019.

Step	Field Number	Field Description	Amounts	Total
<b>Step 2: Total income</b>	10100	Employment income	\$215,000.00	
	12100	Interest and other investment income	\$20,000.00	
	12700	Taxable capital gains	\$15,000.00	
	15000	Total income (sum of all the above lines in Step 2)		\$250,000.00
<b>Step 3: Net income</b>	20800	RRSP deduction	\$27,230.00	
	22215	Deduction for CPP or QPP enhanced contributions on employment income	\$80.85	
	23600	Net income (Total income less all the above deductions in Step 3)		\$222,691.53
<b>Step 4: Taxable income</b>	25300	Net capital losses of other years	\$2,000.00	
	26000	Taxable income (Net income less all the above deductions in Step 4)		\$220,691.53
<b>Step 5: Federal tax Part A: Federal non-refundable tax credits</b>	30800	Base CPP or QPP contributions through employment income	\$2,668.05	
	31200	Employment insurance premiums (maximum \$860.22)	\$860.22	
	31260	Canada employment amount	\$1,222.00	
	33500	Sum of all the above lines in Step 5	\$16,819.27	
	35000	Total federal non-refundable tax credit rate	15%	
		Total federal non-refundable tax credits		\$2,522.89
<b>Part B: Federal tax on taxable income</b>		Federal tax on taxable income (see detail calculations in T1 General form, Step 5, Part B)		\$52,123.99
<b>Part C: Net federal tax</b>	42000	Net Federal Tax (subtract non-refundable tax credits from federal tax)		\$50,261.10
<b>Step 6 – Provincial or territorial tax</b>	42800	Provincial tax payable (calculation methodology similar to that of federal tax, however, the allowed deductions and tax brackets vary across provinces)		\$30,629.46
<b>Step 7: Refund or balance owing</b>	43500	Total payable		\$ 80,230.56
	43700	Net income tax deducted		\$70,000.00
	48500	Balance owing		\$10,230.56

### Problem 1 (no calculations required)

- Step 2: Why is total income greater than employment income?

- ii. Step 2: Which item from the bulleted list on the previous page did Ms. Bigshot enter as “Interest and other investment income”?
- iii. Step 2: Which item from the bulleted list on the previous page did Ms. Bigshot enter as “Capital gain”?
- iv. Step 2: Ms. Bigshot realized \$30,000 of capital gains from selling her stocks. Why does her tax form (field 12700) shows only \$15,000?
- v. Step 3: What is the reason that net income is lower than total income?
- vi. Step 3: Has Ms. Bigshot forgotten to deduct her \$6,500 contribution to the TFSA from her total income?
- vii. Step 4: What is the reason that her taxable income is smaller than net income?
- viii. Step 4: What do you think the term “Net capital loss from previous years” means?
- ix. Step 5, Part A: What are Ms. Bigshot’s total non-refundable tax credits?
- x. Step 5, Part A: How are federal non-refundable tax credits calculated?

Additional information from Ms. Bigshot’s tax filing (to be used for questions xi) to xiv):

Part B – Federal tax on taxable income							
Enter your <b>taxable income</b> from line 26000.					220,689	15	35
Complete the appropriate column depending on the amount on line 35.							
If the amount on line 35 is:							
	\$47,630 or less	more than \$47,630 but not more than \$95,259	more than \$95,259 but not more than \$147,667	more than \$147,667 but not more than \$210,371	more than \$210,371		
Enter the amount from line 35.	0	0	0	0	220,689	15	36
Line 36 minus line 37 (cannot be negative)	0	47,630	95,259	147,667	210,371	00	37
	0	0	0	0	10,318	15	38
	15%	20.5%	28%	29%	33%		39
Multiply line 38 by line 39.	0	0	0	0	3,404	99	40
	0	7,145	16,908	30,535	48,719	00	41
Add lines 40 and 41.	0	0	0	0	52,123	99	42

- xi. Step 5, Part B: What’s Ms. Bigshot’s federal tax on taxable income?
- xii. Step 5, Part B: What tax rates are used on different portions of taxable income to calculate federal tax? Inspect T1 General form, Step 5, Part B and find the relevant line.
- xiii. Step 5, Part B: The Canadian tax system is called progressive. This means that the tax rate increases as the taxpayer makes more money. Justify this statement using the above table.
- xiv. Step 5, Part B: What’s Ms. Bigshot’s net federal tax on taxable income?
- xv. Step 5, Part C: How are federal non-refundable tax credits used to calculate net federal tax?
- xvi. Step 6: What’s Ms. Bigshot’s provincial tax payable?
- xvii. Step 7: What’s Ms. Bigshot’s total tax payable (the sum of federal and provincial taxes)?
- xviii. Step 7: Why is Ms. Bigshot’s balance owing smaller than total tax payable?
- xix. Are there any other taxes that Ms. Bigshot needs to pay in addition to income tax?

## Problem 2 (calculations required)


- i. What is the average percentage tax rate that Ms. Bigshot pays on her total income?
- ii. Before she submitted her tax filing, Ms. Bigshot noticed that she forgot to declare \$1,000 of interest earned in her bank saving account. When she included this amount in the T1 General form, she noticed that her total tax payable increased to \$80,765.86 from \$80,230.56. What is the marginal tax that Ms. Bigshot is subject to?
- iii. If Ms. Bigshot had not contributed \$27,230 to her RRSP, how much more would she pay in 2019 tax year? [Hint: use the marginal tax rate].
- iv. Do you think that Ms. Bigshot will ever pay income tax on the \$27,230 she contributed to RRSP?
- v. If the CRA had declared that \$30,000 should be treated as interest income rather than capital gain, how much more would Ms. Bigshot pay in the 2019 tax year? [Hint: use the marginal tax rate and account for the difference in tax treatment between interest income and capital gains].
- vi. The following table contains marginal tax brackets for combined federal and provincial Ontario taxes. Using this table, calculate total tax payable (federal plus provincial) on taxable income of \$220,691.53. Compare the results to the previously calculated number (field 43500) and comment on the accuracy of the approximate method.

Taxable Income Upper Bound	Marginal Tax Rate
\$12,069.00	0.00%
\$43,906.00	20.05%
\$47,630.00	24.15%
\$77,313.00	29.65%
\$87,813.00	31.48%
Ty h u t	33.89%
\$95,259.00	37.91%
\$147,667.00	43.41%
\$150,000.00	46.41%
\$210,371.00	47.97%
\$220,000.00	51.97%
	53.53%

- vii. Write a mathematical function where the independent variable  $x$  is Taxable Income and the dependent variable  $y$  is Total Payable Tax.
- viii. Write a program code (Python, VBA, Java, etc.) or build an Excel workbook to implement the above mathematical function. Run the program for different values of Taxable Income and plot the results in  $x$  (Taxable Income) and  $y$  (Total Payable Tax) coordinates.

# Appendix

## Federal Tax: T1 General form

	Canada Revenue Agency	Agence du revenu du Canada	Protected B when completed
<b>Income Tax and Benefit Return</b>			<b>2019</b>
<b>Before you start:</b>			
If you are filling out this return for a <b>deceased person</b> , make sure you enter <b>their information</b> in all the boxes in Step 1.			
<b>Step 1 – Identification and other information</b>			
<b>Identification</b>		ON <input type="text" value="7"/>	
First name _____ Last name _____ Mailing Address: Care of _____ Apt. No. _____ No./Street _____ PO Box, RR _____ City _____ Prov./Terr. _____ Postal code _____	<b>Information about you</b> Your social insurance number (SIN): _____ Your date of birth (yyyy/mm/dd): _____ Your language of correspondence: English <input type="checkbox"/> Français <input type="checkbox"/> Votre langue de correspondance : <input type="checkbox"/> <input type="checkbox"/>		
<b>Is this return for a deceased person?</b>			
Ensure the <b>SIN</b> information above is for the deceased person. If this <b>return</b> is for a <b>deceased person</b> , enter the date of death (dd/mm/yyyy): _____			
<b>Marital status</b>			
Marital status on December 31, 2019: _____			
<b>Information about your spouse or common-law partner (if applicable)</b>			
Enter their SIN: _____ Enter their first name: _____ Enter their net income for 2019 to claim certain credits: <input type="text" value="0"/> <input type="text" value="00"/> Enter the amount of universal child care benefit (UCCB) from line 11700 of their return: <input type="text" value="0"/> <input type="text" value="00"/> Enter the amount of UCCB repayment from line 21300 of their return: <input type="text" value="0"/> <input type="text" value="00"/> Tick this box if they were self-employed in 2019: 1 <input type="checkbox"/>			
<b>Information about your residence</b>			
Enter your province or territory of residence on <b>December 31, 2019</b> : <u>Ontario</u> Enter the province or territory where you <b>currently</b> reside if it is not the same as your mailing address above: _____ If you were self-employed in 2019, enter the province or territory where your business had a permanent establishment: _____ If you <b>became</b> or <b>ceased</b> to be a <b>resident of Canada</b> for income tax purposes <b>in 2019</b> , enter the date of: entry (mm/dd) _____ or departure (mm/dd) _____			
<b>Do not use this area</b>			

**Step 1 – Identification and other information (continued)**

Please answer the following questions.

**Elections Canada** (For more information, see "Elections Canada" under Step 1, in the guide.)

A) Do you have Canadian citizenship?

Yes  1 No  2

If yes, go to question B. If no, skip question B.

B) As a Canadian citizen, do you authorize the Canada Revenue Agency to give your name, address, date of birth, and citizenship to Elections Canada to update the National Register of Electors or, if you are aged 14 to 17, to update the Register of Future Electors?

Yes  1 No  2

Your authorization is valid until you file your next tax return. Your information will only be used for purposes permitted under the Canada Elections Act, which include sharing lists of electors produced from the National Register of Electors with provincial and territorial electoral agencies, members of Parliament, registered and eligible political parties, and candidates at election time.

Your information in the Register of Future Electors will be included in the National Register of Electors once you turn 18. Information from the Register of Future Electors can be shared only with provincial and territorial electoral agencies that are allowed to collect future elector information. In addition, Elections Canada can use information in the Register of Future Electors to provide youth with educational information about the electoral process.

**Indian Act – Exempt income**

Tick this box if you have any income that is exempt under the Indian Act.

For more information on this type of income, go to [canada.ca/taxes-aboriginal-peoples](http://canada.ca/taxes-aboriginal-peoples).

1

If you tick the box, get and complete Form T90, Income Exempt under the Indian Act. Complete this form so that the CRA can calculate your Canada training credit limit for the 2020 tax year. The information you provide may also be used to calculate your Canada workers benefit for the 2019 tax year, if applicable.

**Foreign property**

Did you own or hold specified foreign property where the total cost amount of all such property, at any time in 2019, was more than CANS100,000?

26600 Yes  1 No  2

If yes, get and complete Form T1135, Foreign Income Verification Statement. There are substantial penalties for not completing and filing Form T1135 by the due date. For more information, see Form T1135.

**Step 2 – Total income**

As a resident of Canada, you have to report your income from all sources both inside and outside Canada. The Income Tax and Benefit Guide may have additional information for certain lines.

Employment income (box 14 of all T4 slips)				10100	215,000	00
Tax-exempt income for emergency services volunteers (See line 10100 in the guide.)	10105	0	00			
Commissions included on line 10100 (box 42 of all T4 slips)	10120	0	00			
Wage-loss replacement contributions (See line 10100 in the guide.)	10130	0	00			
Other employment income				10400	0	00
Old age security pension (box 18 of the T4A(OAS) slip)				11300	0	00
CPP or QPP benefits (box 20 of the T4A(P) slip)				11400	0	00
Disability benefits included on line 11400 (box 16 of the T4A(P) slip)	11410	0	00			
Other pensions and superannuation (See line 11500 in the guide and complete line 31400 in the Worksheet for the return.)				11500	0	00
Elected split-pension amount (Get and complete Form T1032.)				11600	0	00
Universal child care benefit (UCCB) (See the RC62 slip.)				11700	0	00
UCCB amount designated to a dependant	11701					
Employment insurance and other benefits (box 14 of the T4E slip)				11900	0	00
Employment insurance maternity and parental benefits and provincial parental insurance plan benefits	11905	0	00			
Taxable amount of dividends (eligible and other than eligible) from taxable Canadian corporations (Complete the Worksheet for the return.)				12000	0	00
Taxable amount of dividends other than eligible dividends, included on line 12000, from taxable Canadian corporations	12010	0	00			
Interest and other investment income (Complete the Worksheet for the return.)				12100	20,000	00
Net partnership income: limited or non-active partners only				12200	0	00
Registered disability savings plan income (box 131 of the T4A slip)				12500	0	00
Rental income	Gross	12599	0 00	Net	12600	0 00
Taxable capital gains (Complete Schedule 3.)				12700	15,000	00
Support payments received	Total	12799		Taxable amount	12800	
RRSP income (from all T4RSP slips)				12900	0	00
Other income Specify:				13000	0	00
Taxable scholarship, fellowships, bursaries, and artists' project grants				13010	0	00
<b>Self-employment income</b>						
Business income	Gross	13499	0 00	Net	13500	0 00
Professional income	Gross	13699	0 00	Net	13700	0 00
Commission income	Gross	13899	0 00	Net	13900	0 00
Farming income	Gross	14099	0 00	Net	14100	0 00
Fishing income	Gross	14299	0 00	Net	14300	0 00
Workers' compensation benefits (box 10 of the T5007 slip)	14400	0	00			
Social assistance payments	14500	0	00			
Net federal supplements (box 21 of the T4A(OAS) slip)	14600	0	00			
Add lines 14400, 14500, and 14600. (See line 25000 in Step 4.)				0	00	▶ 14700 0 00
Add lines 10100, 10400 to 11400, 11500 to 11700, 11900, 12000, 12100 to 12500, 12800, 12700, 12800, 12900 to 13010, 13500, 13700, 13900, 14100, 14300, and 14700.				This is your total income.	15000	250,000 00

### Step 3 – Net income

Enter your **total income** from line 15000 from the previous page.

15000	250,000	00
Pension adjustment (box 52 of all T4 slips and box 034 of all T4A slips)		
20600	0	00
Registered pension plan deduction (box 20 of all T4 slips and box 032 of all T4A slips)		
20700	0	00
RRSP deduction (See Schedule 7 and <b>attach</b> receipts.)		
20800	27,230	00
Pooled registered pension plan (PRPP) employer contributions (amount from your PRPP contribution receipts)		
20810	0	00
Deduction for elected split-pension amount (Get and complete Form T1032.)		
21000	0	00
Annual union, professional, or like dues (receipts and box 44 of all T4 slips)		
21200	0	00
Universal child care benefit repayment (box 12 of all RC82 slips)		
21300	0	00
Child care expenses (Get and complete Form T778.)		
21400	0	00
Disability supports deduction (Get and complete Form T929.)		
21500	0	00
Business investment loss		
Gross	21699	0 00
Allowable deduction	21700	0 00
Moving expenses (Get and complete Form T1-M.)		
21900	0	00
Support payments made		
Total	21999	0 00
Allowable deduction	22000	0 00
Carrying charges and interest expenses (Complete the Worksheet for the return.)		
22100	0	00
Deduction for CPP or QPP contributions on self-employment and other earnings (Complete Schedule 8 or get and complete Form RC381, whichever applies.)		
22200	0	00
Deduction for CPP or QPP enhanced contributions on employment income (Complete Schedule 8 or get and complete Form RC381, whichever applies.)		
22215	80	85
Exploration and development expenses (Get and complete Form T1229.)		
22400	0	00
Other employment expenses		
22900	0	00
Clergy residence deduction (Get and complete Form T1223.)		
23100	0	00
Other deductions Specify:		
23200	0	00
Add lines 20700, 20800, 21000 to 21500, 21700, 21900, 22000, and 22100 to 23200.		
23300	27,310	85
Line 15000 minus line 23300 (if negative, enter '0')		
This is your <b>net income before adjustments.</b>		
23400	222,689	15
Social benefits repayment (If you reported income at line 11900 and the amount at line 23400 is greater than \$86,375, see the repayment chart on the back of your T4E slip. If you reported income on lines 11300 or 14600, and the amount at line 23400 is greater than \$77,580, complete the chart for line 23500 on the Worksheet for the return. Otherwise, enter '0'.)		
23500	0	00
Line 23400 minus line 23500 (if negative, enter '0')		
This is your <b>net income.</b>		
23600	222,689	15

### Step 4 – Taxable income

Canadian Forces personnel and police deduction (box 43 of all T4 slips)		
24400	0	00
Security options deductions		
24900	0	00
Other payments deduction (Claim the amount from line 14700, unless it includes an amount at line 14600. If so, see line 25000 in the guide.)		
25000	0	00
Limited partnership losses of other years		
25100	0	00
Non-capital losses of other years		
25200	0	00
Net capital losses of other years		
25300	2,000	00
Capital gains deduction (Get and complete Form T857.)		
25400	0	00
Northern residents deductions (Get and complete Form T2222.)		
25500	0	00
Additional deductions Specify:		
25600	0	00
Add lines 24400 to 25600.		
25700	2,000	00
Line 23600 minus line 25700 (if negative, enter '0')		
This is your <b>taxable income.</b>		
26000	220,689	15



**Step 5 – Federal tax (formerly Schedule 1)**

**Part A – Federal non-refundable tax credits**

Basic personal amount	claim \$12,069	30000	12,069	00	1
Age amount (if you were born in 1954 or earlier) (Complete the Worksheet for the return.)	(maximum \$7,494)	30100	0	00	2
Spouse or common-law partner amount (Complete Schedule 5.)		30300	0	00	3
Amount for an eligible dependant (Complete Schedule 5.)		30400	0	00	4
Canada caregiver amount for spouse or common-law partner, or eligible dependant age 18 or older (Complete Schedule 5.)		30425	0	00	5
Canada caregiver amount for other infirm dependants age 18 or older (Complete Schedule 5.)		30450	0	00	6
Canada caregiver amount for infirm children under 18 years of age					
Enter the number of children for whom you are claiming this amount.	30499		x \$2,230 =	30500	0 00 7
Base CPP or QPP contributions:					
through employment income (Complete Schedule 8 or get and complete Form RC381, whichever applies.)		30800	2,668	05	+ 8
on self-employment and other earnings (Complete Schedule 8 or get and complete Form RC381, whichever applies.)		31000	0	00	+ 9
Employment insurance premiums:					
through employment from box 18 and box 55 of all T4 slips (maximum \$860.22)		31200	860	22	+ 10
on self-employment and other eligible earnings (Complete Schedule 13.)		31217	0	00	+ 11
Volunteer firefighters' amount		31220			12
Search and rescue volunteers' amount		31240			13
Canada employment amount (Enter \$1,222 or the total of your employment income you reported on lines 10100 and 10400, whichever is less.)		31260	1,222	00	14
Home buyers' amount		31270			15
Home accessibility expenses (Complete the Worksheet for the return.)	(maximum \$10,000)	31285	0	00	16
Adoption expenses		31300	0	00	17
Pension income amount (Complete the Worksheet for the return.)	(maximum \$2,000)	31400	0	00	18
Disability amount (for self) (Claim \$8,410 or if you were under 18 years of age, complete the Worksheet for the return.)		31600	0	00	19
Disability amount transferred from a dependant (Complete the Worksheet for the return.)		31800	0	00	20
Interest paid on your student loans (See Guide P105.)		31900	0	00	21
Your tuition, education, and textbook amounts (Complete Schedule 11.)		32300	0	00	22
Tuition amounts transferred from a child		32400	0	00	23
Amounts transferred from your spouse or common-law partner (Complete Schedule 2.)		32600	0	00	24
Medical expenses for self, spouse or common-law partner, and your dependent children born in 2002 or later	33099		0	00	25
Enter \$2,352 or 3% of line 23600, whichever is less.			2,352	00	26
Subtotal (if negative, enter '0')			0	00	27
Allowable amount of medical expenses for other dependants (Complete the Worksheet for the return.)	33199		0	00	28
Add lines 27 and 28.			0	00	▶
Add lines 1 to 24, and line 29.			33200	0	00 29
Federal non-refundable tax credit rate			33500	16,819	27 30
Multiply line 30 by line 31.				15%	31
Donations and gifts (Complete Schedule 9.)			33800	2,522	89 32
Add lines 32 and 33.			34900	0	00 33
Enter this amount on line 46 on the next page.			<b>Total federal non-refundable tax credits</b>	<b>35000</b>	<b>2,522 89 34</b>

**Part B – Federal tax on taxable income**

Enter your taxable income from line 28000.					220,889	15	35
Complete the appropriate column depending on the amount on line 35.		more than \$47,630 but not more than \$95,259	more than \$95,259 but not more than \$147,667	more than \$147,667 but not more than \$210,371	more than \$210,371		
If the amount on line 35 is:	\$47,630 or less						
Enter the amount from line 35.	0 00	0 00	0 00	0 00	220,889	15	36
Line 36 minus line 37 (cannot be negative)	0 00	47,830 00	95,259 00	147,667 00	210,371 00		37
Multiply line 38 by line 39.	0 00	0 00	0 00	0 00	10,318 15		38
Add lines 40 and 41.	0 00	7,145 00	16,908 00	30,535 00	3,404 99		39
	0 00	0 00	0 00	0 00	48,719 00		40
	0 00	0 00	0 00	0 00	52,123 99		41
	0 00	0 00	0 00	0 00			42

**Part C – Net federal tax**

Enter the amount from line 42.		52,123	99	43			
Federal tax on split income (Get and complete Form T1206.)	40424	0	00	- 44			
Add lines 43 and 44.	40400	52,123	99			52,123	99 45
Enter your total federal non-refundable tax credits from line 37 on the previous page.	35000	2,522	89	46			
Federal dividend tax credit (See line 40425 in the guide.)	40425	0	00	- 47			
Minimum tax carryover (Get and complete Form T891.)	40427	0	00	- 48			
Add lines 46, 47, and 48.		2,522	89			2,522	89 49
Line 45 minus line 49 (if negative, enter "0")						49,601	10 50
Federal foreign tax credit (Get and complete Form T2209.)						0	00 51
Subtotal: Basic federal tax minus foreign tax credits						49,601	10
Recapture of investment tax credit (attach form T2038(IND))						0	00
Subtotal plus recapture of investment tax credit (if negative, enter "0")						49,601	10 52
Federal logging tax credit						0	00
Federal tax minus logging tax credit (if negative, enter "0")						49,601	10
Total federal political contributions (attach receipts)	40900	0	00	53			
Federal political contribution tax credit (see Help) (maximum \$650)	41000	0	00	- 54			
Investment tax credit (attach Form T2038(IND))	41200	0	00	- 55			
Labour-sponsored funds tax credit (See lines 41300 and 41400 in the guide.)							
Net cost of shares of a provincially registered fund	41300	0	00		41400	0	00 - 56
Add lines 54, 55, and 56.	41600	0	00			0	00 57
Total federal tax minus line 57 (if negative, enter "0").						49,601	10 58
Canada workers benefit advance payments received (box 10 of the RC210 slip)	41500						- 5
Special taxes (See line 41800 in the guide.)	41800	0	00			0	00 60
Add lines 58, 59, and 60.							
Enter this amount on line 42000 on the next page.						49,601	10 61

**Step 6 – Provincial or territorial tax**

Complete Form 428 to calculate your provincial tax.

**Step 7 – Refund or balance owing**

Net federal tax: enter the amount from line 61 from the previous page.	42000	49,601	10	
CPP contributions payable on self-employment and other earnings (Complete Schedule 8 or get and complete Form RC381, whichever applies.)	42100	0	00	
Employment insurance premiums payable on self-employment and other eligible earnings (Complete Schedule 13.)	42120	0	00	
Social benefits repayment (amount from line 23500)	42200	0	00	
Provincial or territorial tax (Attach Form 428, even if the result is "0".)	42800	30,629	46	
Add lines 42000, 42100, 42120, 42200, and 42800.				
This is your total payable.				43500 80,230 56
Total income tax deducted (amounts from all Canadian slips)	43700	70,000	00	
Refundable Quebec abatement (See line 44000 in the guide.)	44000	0	00	
CPP overpayment (See line 30800 in the guide.)	44800	0	00	
Employment insurance overpayment (See line 45000 in the guide.)	45000	0	00	
Climate action incentive (Complete Schedule 14.)	45110	0	00	
Refundable medical expense supplement (Complete the Worksheet for the return.)	45200	0	00	
Canada workers benefit (CWB) (Complete Schedule 8.)	45300	0	00	
Refund of investment tax credit (Get and complete Form T2038(IND).)	45400	0	00	
Part XII.2 trust tax credit (box 38 of all T3 slips and box 209 of all T5013 slips)	45600	0	00	
Employee and partner GST/HST rebate (Get and complete Form GST370.)	45700	0	00	
Eligible educator school supply tax credit				
Supplies expenses (maximum \$1,000) 46800 x 15% =	46900	0	00	
Tax paid by instalments	47600			
Provincial or territorial credits (Complete Form 479, if it applies.)	47900	0	00	
Add lines 43700 to 45700, and 46900 to 47900.				
These are your total credits.				48200 70,000 00
Line 43500 minus line 48200				10,230 56

If the result is negative, you have a refund. If the result is positive, you have a balance owing.

Enter the amount below on whichever line applies.

Generally, we do not charge or refund a difference of \$2 or less.


Refund **48400** 0 00

Balance owing **48500** 10,230 56

For more information on how to receive your refund by direct deposit, see line 48400 in the guide or go to [canada.ca/cra-direct-deposit](http://canada.ca/cra-direct-deposit).

For more information on how to make your payment, see line 48500 in the guide or go to [canada.ca/payments](http://canada.ca/payments). Your payment is due no later than April 30, 2020.

# Provincial (Ontario) Tax Form



## Ontario Tax

**Form ON428**  
**2019**  
Protected B when completed

This is **Step 6** in completing your return. Complete this form and **attach a copy** to your return.  
Claim only the credits that apply to you.

### Part A – Ontario non-refundable tax credits

	For internal use only			
Basic personal amount	56050			
Age amount (if born in 1954 or earlier) (use Worksheet ON428)	Claim \$10,582 58040	10,582	00	1
Spouse or common-law partner amount	(maximum \$5,166) 58080	0	00	2
Spouse amount	9,883	00		3
Your spouse's or common-law partner's net income from line 23600 of their return	90,921	53		4
Line 3 minus 4 (if negative, enter '0')	0	00	(maximum \$8,985) ▶	58120
Amount for an eligible dependant				0 00
Base amount	9,883	00		6
Your eligible dependant's net income from line 23600 of their return	0	00		7
Line 6 minus line 7 (if negative, enter '0')			(maximum \$8,985) ▶	58160
				0 00
Add lines 1, 2, 5, and 8.				10,582 00
Ontario caregiver amount (use Worksheet ON428)	58185	0	00	10
CPP and QPP contributions:				
Amount from line 30800 of your return	58240	2,668	05	11
Amount from line 31000 of your return	58280	0	00	12
Employment insurance premiums:				
Amount from line 31200 of your return	58300	860	22	13
Amount from line 31217 of your return	58305	0	00	14
Adoption expenses (maximum \$12,910)	58330	0	00	15
Pension income amount (maximum \$1,463)	58360	0	00	16
Disability amount (for self) (Claim \$8,549, or if you were under 18 years of age, use Worksheet ON428.)	58440	0	00	17
Disability amount transferred from a dependant (use Worksheet ON428)	58480	0	00	18
Interest paid on your student loans (amount from line 31900 of your return)	58520	0	00	19
Your unused tuition and education amounts (attach Schedule ON(S11))	58560	0	00	20
Amounts transferred from your spouse or common-law partner (attach Schedule ON(S2))	58640	0	00	21
Add lines 9 to 21.				14,110 27

Continue on the next page.

Form ON428

**Part A – Ontario non-refundable tax credits (continued)**

Enter the amount from line 22 of the previous page		14,110	27	23
Medical expenses:				
(Read line 58889 of your income tax package.)	58689	0	00	24
Enter whichever is less:				
\$2,395 or 3% of the amount on line 23600 of your return		2,395	00	25
Line 24 minus line 25 (if negative, enter "0")		0	00	26
Allowable amount of medical expenses for other dependants (use Worksheet ON428)	58729	0	00	27
Add lines 26 and 27.	58769	0	00	28
Add lines 23 and 28, plus line 11 of RC289.		58800	14,110	27
Ontario non-refundable tax credit rate			5.05%	30
Multiply line 29 by line 30.		58840	712	57
Donations and gifts:				
Amount from line 16 of your federal Schedule 9		0	00	32
x 5.05% =		0	00	
Amount from line 16 of your federal Schedule 9		0	00	33
x 11.16% =		0	00	
Add lines 32 and 33.	58969	0	00	34
Add lines 31 and 34.			0	00
Enter this amount on line 47.	Ontario non-refundable tax credits	61500	712	57

**Part B – Ontario tax on taxable income**

Enter your <b>taxable income</b> from line 26000 of your return.		220,889	15	36	
Use the amount from line 36 to decide which column to complete.					
	Line 36 is \$43,906 or less	Line 36 is more than \$43,906 but not more than \$87,813	Line 36 is more than \$87,813 but not more than \$150,000	Line 36 is more than \$150,000 but not more than \$220,000	Line 36 is more than \$220,000
Amount from line 36	0	0	0	0	220,889
Line 37 minus line 38 (cannot be negative)	0	43,908	87,813	150,000	220,000
	0	0	0	0	689
	5.05%	9.15%	11.16%	12.16%	13.16%
Multiply line 39 by line 40.	0	0	0	0	90
Add lines 41 and 42.	0	2,217	6,235	13,175	21,887
Ontario tax on taxable income	0	0	0	0	21,777

Form ON428

**Part C – Ontario tax**

Enter your Ontario tax on taxable income from line 43 of the previous page.		21,777	69	44
Enter your Ontario tax on split income from Form T1206.	61510	0	00	45
Add lines 44 and 45.		21,777	69	46
Enter your Ontario non-refundable tax credits from line 35 of the previous page.		712	57	47
Line 46 minus line 47 (if negative, enter "0")		21,065	12	48
Ontario minimum tax carryover:				
Amount from line 48 above		21,085	12	49
Enter the Ontario dividend tax credit calculated for line 61520 from your Worksheet ON428.		0	00	50
Line 49 minus line 50 (if negative, enter "0")		21,085	12	51
Amount from line 40427 of your return		0	00	52
Enter whichever is less: amount from line 51 or 52.		61540	0	53
Line 48 minus line 53 (if negative, enter "0")		21,085	12	54
Ontario surtax				
Amount from line 54 above		21,085	12	55
Amount from line 45 above		0	00	56
Line 55 minus line 56 (if negative, enter "0")		21,085	12	57
Complete lines 58 to 60 if the amount on line 57 is more than \$4,740. If the amount is less than \$4,740, enter "0" on line 60 and continue on line 61.				
(Line 57 21,085 12 - \$4,740) × 20% (if negative, enter "0") =		3,285	02	58
(Line 57 21,085 12 - \$6,067) × 36% (if negative, enter "0") =		5,399	32	59
Add lines 58 and 59.		8,684	34	60
Add lines 54 and 60.		29,729	46	61
Ontario dividend tax credit:				
Amount from line 50 above	61520	0	00	62
Line 61 minus line 62 (if negative, enter "0")		29,729	46	63
Ontario additional tax for minimum tax purposes				
If you entered an amount on line 98 of Form T691, enter the additional tax for minimum tax purposes calculated for line 64 from your Worksheet ON428.		0	00	64
Add lines 63 and 64.		29,729	46	65

Part C – Ontario tax (continued)		Form ON428	
Enter the amount from line 65 of the previous page.		29,729	46 66
<b>Ontario tax reduction</b>			
Enter "0" on line 73 if <b>any</b> of the following applies to you: • You were <b>not</b> a resident of Canada at the beginning of the year. • You were <b>not</b> a resident of Ontario on December 31, 2019. • There is an amount on line 64. • The amount on line 66 is "0". • Your return is filed for you by a trustee in bankruptcy. • You are <b>not</b> claiming an Ontario tax reduction.  If none of the above applies to you, complete lines 67 to 73 to calculate your Ontario tax reduction.			
<input checked="" type="checkbox"/> Check this box to claim the tax reduction on your return			
Basic reduction		244	00 67
If you had a spouse or common-law partner on December 31, 2019, <b>only</b> the individual with the <b>higher net income</b> can claim the amounts the individual with the higher net income can claim the amounts			
Reduction for dependent children born in 2001 or later			
Number of dependent children	60969	x \$452 =	0 00 68
Reduction for dependants with a mental or physical impairment			
Number of dependants	60970	x \$452 =	0 00 69
Add lines 67, 68, and 69.		244	00 70
Amount from line 70 above		488	00 71
Amount from line 66 above		29,729	46 72
Line 71 minus line 72 (if negative, enter "0")			
<b>Ontario tax reduction</b>		0	00 73
Line 66 minus line 73 (if negative, enter "0")		29,729	46 74
<b>Ontario foreign tax credit</b>			
Credit calculated from Form T2036		0	00 75
Line 74 minus line 75 (if negative, enter "0")		29,729	46 76
<b>Low-income individuals and families tax credit</b>			
Credit calculated from Schedule ON428-A		62140	0 00 77
Line 76 minus line 77 (if negative, enter "0")		29,729	46 78
<b>Community food program donation tax credit for farmers</b>			
Enter the amount of qualifying donations that have also been claimed as a charitable donation.		62150	0 00
		x 25% =	0 00 79
Line 78 minus line 79 (if negative, enter "0")		29,729	46 80
<b>Ontario health premium</b>			
Use the chart on the next page to calculate this amount.		900	00 81
Add lines 80 and 81.			
Enter the result on line 42800 of your return.		30,629	46 82
		<b>Ontario tax</b>	

**Part C – Ontario tax (continued)** Form ON428

**Ontario Health Premium**

Enter your **taxable income** from line 38 of page 2. 220,688 | 15 | 83

Go to the line on the chart below that corresponds to your taxable income from line 83 to determine your Ontario Health Premium.  
Enter the result on line 81 of the previous page.

Taxable income	Ontario health premium			
not more than \$20,000	▶	▶	▶	\$0
more than \$20,000, but not more than \$25,000	<input type="text" value="0"/>   <input type="text" value="00"/>	- \$20,000 =	<input type="text" value="0"/>   <input type="text" value="00"/> x 6% =	<input type="text" value="0"/>   <input type="text" value="00"/>
more than \$25,000, but not more than \$36,000	▶	▶	▶	\$300
more than \$36,000, but not more than \$38,500	<input type="text" value="0"/>   <input type="text" value="00"/>	- \$36,000 =	<input type="text" value="0"/>   <input type="text" value="00"/> x 6% =	<input type="text" value="0"/>   <input type="text" value="00"/> + \$300 = <input type="text" value="0"/>   <input type="text" value="00"/>
more than \$38,500, but not more than \$48,000	▶	▶	▶	\$450
more than \$48,000, but not more than \$48,600	<input type="text" value="0"/>   <input type="text" value="00"/>	- \$48,000 =	<input type="text" value="0"/>   <input type="text" value="00"/> x 25% =	<input type="text" value="0"/>   <input type="text" value="00"/> + \$450 = <input type="text" value="0"/>   <input type="text" value="00"/>
more than \$48,600, but not more than \$72,000	▶	▶	▶	\$600
more than \$72,000, but not more than \$72,600	<input type="text" value="0"/>   <input type="text" value="00"/>	- \$72,000 =	<input type="text" value="0"/>   <input type="text" value="00"/> x 25% =	<input type="text" value="0"/>   <input type="text" value="00"/> + \$600 = <input type="text" value="0"/>   <input type="text" value="00"/>
more than \$72,600, but not more than \$200,000	▶	▶	▶	\$750
more than \$200,000, but not more than \$200,600	<input type="text" value="0"/>   <input type="text" value="00"/>	- \$200,000 =	<input type="text" value="0"/>   <input type="text" value="00"/> x 25% =	<input type="text" value="0"/>   <input type="text" value="00"/> + \$750 = <input type="text" value="0"/>   <input type="text" value="00"/>
more than \$200,600	▶	▶	▶	\$900

## CPP Contributions

<https://www.canada.ca/en/revenue-agency/services/tax/businesses/topics/payroll/payroll-deductions-contributions/canada-pension-plan-cpp/cpp-contribution-rates-maximums-exemptions.html>

Year	Maximum annual pensionable earnings	Basic exemption amount	Maximum contributory earnings	Employee and employer contribution rate (%)	Maximum annual employee and employer contribution	Maximum annual self-employed contribution
2020	\$58,700	\$3,500	\$55,200	5.25	\$2,898.00	\$5,796.00
2019	\$57,400	\$3,500	\$53,900	5.10	\$2,748.90	\$5,497.80

## EI Premia

<https://www.canada.ca/en/revenue-agency/services/tax/businesses/topics/payroll/payroll-deductions-contributions/employment-insurance-ei/ei-premium-rates-maximums.html>

Year	Maximum annual insurable earnings	Rate (%)	Maximum annual employee premium	Maximum annual employer premium
2020	\$54,200	1.58	\$856.36	\$1,198.90
2019	\$53,100	1.62	\$860.22	\$1,204.31



# Solutions - Income Tax

## Case Study: Ms. Bigshot

### Solution 1

- i. Total income includes all sources of income, including employment income. In the case of Ms. Bigshot, it includes interest from GICs and capital gains from selling stocks. Other items that can be included in total income are dividends, rental income, various benefits received (Canada Pension Plan, old age security, disability, child care), employment-related insurance payments received (employment insurance, maternity payments, disability payments, support payments, wage replacements), pension payments, RRSP withdrawals, RESP withdrawals, and others.
- ii. An example of “Interest and other investment income” is interest payments received from GICs (Guaranteed Investment Certificates) and savings accounts. Dividends received from non-Canadian companies are also treated as interest for tax purposes.
- iii. An example of capital gain is a gain from selling stocks, ETFs or mutual funds. Investors in mutual funds can also have capital gains without selling their units of mutual funds. They will see those capital gains on T3 or T5 tax slips.
- iv. Although Ms. Bigshot realized \$30,000 of capital gains from selling her stocks, only 50% of this gain is taxable. This is why her tax form (field 12700) shows only \$15,000 instead of \$30,000. Capital gains are much more tax-efficient than interest income.
- v. Net income is calculated by subtracting multiple deductions from total income. Deductions lower income tax. High tax bracket taxpayers benefit from deductions more than low tax bracket taxpayers. Examples of deductions are: a pension plan contribution, RRSP contribution, professional/union dues, selected child care expenses, part of CPP contributions, and employment expenses.
- vi. It is true that Ms. Bigshot made \$6,500 contribution to the TFSA. However, TFSA contributions are not treated as tax deductions (unlike RRSP contributions, which are considered tax deductions).
- vii. Taxable income is calculated by subtracting additional deductions and losses from net income. Ms. Bigshot claims \$2000 of capital losses from previous years to calculate taxable income. Taxable income is used as a basis for calculating both federal and provincial income tax.
- viii. An example of net capital loss from previous years is a loss on selling a stock at a lower price than the purchase price - in 2018 or earlier years. Capital losses can be used to offset any capital gains in the same calendar year or can be ‘carried forward’ and claimed in future years.
- ix. Ms. Bigshot’s total non-refundable tax credits include a basic personal amount (\$12,069), Canada employment amount (\$1,222), base CPP contribution (\$2,668.05) and Employment Insurance (\$860.22). Other items that are considered as tax credits are: tuition and textbooks amounts, interest paid on student loans, age amount (for those at 65 and above), spouse or common law partner amount, amount for eligible dependent, caregiver amounts, firefighter and search & rescue volunteers’ amount, home buyers amount, home accessibility expenses, adoption expenses, disability amounts, medical expenses and some pension income.
- x. Tax credits are amounts that reduce the tax you pay on your taxable income. All federal non-refundable tax credits are summed up together and multiplied by 15% to get the dollar amount that can be used to reduce the tax you pay on taxable income. The 15% is the lowest federal tax rate applicable to taxable income up to \$47,630. The above calculation method ensures that non-refundable tax credits have the same dollar value for both low-tax-rate (15%) individuals and high-tax-rate (33%) individuals. This is in contrast to tax deductions that have



higher dollar value for high-tax-rate individuals. In general, the non-refundable tax credits must be used in the current tax year. Any tax credit in excess of payable taxes is left unused. Only some non-refundable tax credits such as “tuition education and textbook amounts” can be carried forward to future years or transferred to parents/guardians.

- xi. Ms. Bigshot’s federal tax on taxable income is \$52,123.99 (as per field 42).
- xii. Different portions of taxable income are subject to different tax rates. T1 General form, Step 5, Part B shows what federal tax is applied to what part of taxable income. The answer is summarized in the table below:

Taxable Income		Tax Rate
More Than	Not More Than	
\$ -	\$ 47,630.00	15.00%
\$ 47,630.00	\$ 95,259.00	20.50%
\$ 95,259.00	\$ 147,667.00	26.00%
\$ 147,667.00	\$ 210,371.00	29.00%
\$ 210,371.00		33.00%

- xiii. The table above illustrates that, indeed, the tax rate increases (i.e. progresses) from 15% to 33% with the growing taxable income. This is why the Canadian tax system is called progressive.
- xiv. Ms. Bigshot’s net federal tax on taxable income is \$49,501.10 as per field 42000.
- xv. To calculate net federal tax, we start with federal tax on taxable income of \$52,123.99 and subtract from it total federal non-refundable tax credits of \$2,522.89.
- xvi. Ms. Bigshot’s provincial tax payable is \$30,629.46 as per field 42800. Calculation of provincial tax follows similar logic to that used in federal tax calculations. However, additional deductions and tax credits are introduced, different tax brackets and tax rates are used, and additional surcharges may be applied. Details can be found in the filled provincial tax forms included in the Appendix.
- xvii. Ms. Bigshot’s total tax payable, i.e. the sum of federal and provincial taxes, is \$80,230.56 as per field 43500?
- xviii. Ms. Bigshot’s balance owing of \$10,230 is less than the total tax payable of \$80,230.56 because she has already paid \$70,000 in taxes throughout the year. Canadian employers must deduct the estimated income taxes and other statutory deductions (CPP contributions, EI premium) from each paycheck. In the case of Ms. Bigshot, the deductions were not sufficient as the employer was unaware of her investments. Quite likely, the CRA will ask that Ms. Bigshot pay tax by installment in the tax year 2020 to ensure that her balance owing does not exceed \$2000.
- xix. In addition to income taxes, Ms. Bigshot pays 13% HST (Harmonized Sales Tax) on nearly all purchases she makes throughout the year (she lives in Ontario; the tax will differ in other provinces). If she spends \$50,000, she will pay \$6,500 in HST. If Ms. Bigshot lives in a house or a condo, she pays property tax. The tax will vary based on the municipality and the market value of the house. One could roughly estimate that she would pay between \$8,000 to \$15,000 in property taxes.
- xx. The average tax rate in percent that Ms. Bigshot pays on her total income can be calculated as  $\$80,230.66 / \$250,000$  which is around 32.09%, i.e. roughly one third of her total income.
- xxi. The marginal tax that Ms. Bigshot is subject to can be calculated as  $(\$80,765.86 - \$80,230.56) / \$1000 = 53.53\%$ , i.e. the highest marginal tax bracket for Ontario tax payers. The marginal tax can be used to calculate how much income tax Ms. Bigshot needs to pay on each additional dollar of taxable income
- xxii. If Ms. Bigshot had not contributed \$27,230 to her RRSP, her taxable income would have been \$27,230 higher. On that higher income she would pay additional income tax at the marginal tax of 53.53%. Thus, her additional tax would be  $\$27,230 * 53.53\% = \$14,576.22$ . This calculation

demonstrates that the RRSP deduction is worth a lot to a high-tax-bracket individual. The same deduction for a taxpayer in the 20% tax bracket would be worth only  $\$27,230 * 20\% = \$5,446$ . Thus, a high-tax-bracket individual gets \$9,130 more in tax savings than the low-tax-bracket individual on the maximum allowed RRSP contribution.

- xxiii. Ms. Bigshot will pay income tax when she withdraws her money from the RRSP. While in the RRSP, her money will grow tax-free. Ms. Bigshot's strategy is to withdraw money from the RRSP in the future when her marginal tax bracket will be lower. To illustrate how this strategy might work, imagine that Ms. Bigshot loses her job in 2020 and in 2021 her only income is \$15,000 from investments. That year, she withdraws \$27,230 from her RRSP. Her marginal tax bracket is 20%, and thus, her tax is \$5,446. Thus, on the \$27,230 income she paid tax of \$5,446 in 2021 instead of paying tax of \$14,567.22 in 2019. This tax strategy allowed Ms. Bigshot to save \$9,130 in taxes.
- xxiv. If the CRA had declared that \$30,000 should be treated as interest income rather than capital gain, Ms. Bigshot would have to pay tax on the whole \$30,000 instead of \$15,000 that she included in her 2019 taxable income (recall that only half of capital gains is taxable, and thus, only  $50\% * \$30,000 = \$15,000$  was included in her 2019 taxable income). Consequently, Ms. Bigshot would need to pay tax on additional \$15,000 at her marginal tax bracket of 53.53%, i.e.  $\$8,029.50 (53.53\% * \$15,000)$ .

## Solution 2

- i. The average tax rate (in percent) that Ms. Bigshot pays on her total income can be calculated as  $\$80,230.66 / \$250,000$ , which is around 32.09%, i.e. roughly one third of her total income.
- ii. The marginal tax that Ms. Bigshot is subject to can be calculated as  $(\$80,765.86 - \$80,230.56) / \$1000 = 53.53\%$ , i.e. the highest marginal tax bracket for Ontario taxpayers. The marginal tax can be used to calculate how much income tax Ms. Bigshot needs to pay on each additional dollar of taxable income.
- iii. If Ms. Bigshot had not contributed \$27,230 to her RRSP, her taxable income would be \$27,230 higher. On that higher income she would pay additional income tax at the marginal tax of 53.53%. Thus, her additional tax would be  $\$27,230 * 53.53\% = \$14,576.22$ . This calculation demonstrates that the RRSP deduction is worth a lot to a high-tax-bracket individual. The same deduction for a taxpayer in 20% tax bracket would be worth only  $\$27,230 * 20\% = \$5,446$ . Thus, a high-tax-bracket individual gets \$9,130 more in tax savings than the low-tax-bracket individual on the maximum allowed RRSP contribution.
- iv. Ms. Bigshot will pay income tax when she withdraws her money from the RRSP. While in the RRSP, her money will grow tax free. Ms. Bigshot's strategy is to withdraw money from the RRSP in the future when her marginal tax bracket is lower. To illustrate how the strategy might work imagine that Ms. Bigshot loses her job in 2020 and in 2021 her only income is \$15,000 from investments. That year she withdraws \$27,230 from her RRSP. Her marginal tax bracket is 20%, and thus, her tax is \$5,446. Thus, on the \$27,230 income she paid tax of \$5,446 in 2021 instead of paying tax of \$14,567.22 in 2019. This tax strategy allowed Ms. Bigshot to save \$9,130 in taxes.
- v. If the CRA had declared that \$30,000 should be treated as interest income rather than capital gain, Ms. Bigshot would have to pay tax on the whole \$30,000 instead of \$15,000 that she included in her 2019 taxable income (recall that only half of capital gains is taxable, and thus, only  $50\% * \$30,000 = \$15,000$  was included in her 2019 taxable income). Consequently, Ms. Bigshot would need to pay tax on additional \$15,000 at her marginal tax bracket of 53.53%, i.e.  $\$8,029.50 (53.53\% * \$15,000)$ .

vi. In the table below, taxable income of \$220,691.53 is allocated to each tax bracket from the lowest to the highest - see column “Taxable Income per Bracket”. For each bracket, the tax amount is calculated by multiplying values in the column “Marginal Tax Rate” by values in the column “Taxable Income per Bracket”. The results are stored in the column “Tax Amount per Bracket”. The “TOTAL Tax Amount” of \$80,247.07 is the sum of all values in the column “Tax Amount per Bracket”. The value is about \$16.50 higher than the tax calculations of \$80,230.66 on T1 General form. This simple method produces a good approximation of tax payable.

Taxable Income Upper Bound	Marginal Tax Rate	Taxable Income per Bracket	Tax Amount per Bracket
\$12,069.00	0.00%	\$12,069.00	\$-
\$43,906.00	20.05%	\$31,837.00	\$6,383.32
\$47,630.00	24.15%	\$3,724.00	\$ 899.35
\$77,313.00	29.65%	\$29,683.00	\$8,801.01
\$87,813.00	31.48%	\$10,500.00	\$3,305.40
\$91,101.00	33.89%	\$3,288.00	\$1,114.30
\$95,259.00	37.91%	\$4,158.00	\$1,576.30
\$147,667.00	43.41%	\$52,408.00	\$22,750.31
\$150,000.00	46.41%	\$2,333.00	\$1,082.75
\$210,371.00	47.97%	\$60,371.00	\$28,959.97
\$220,000.00	51.97%	\$9,629.00	\$5,004.19
	53.53%	\$691.53	\$ 370.18
		TOTAL Taxable Income	TOTAL Tax Amount

vii) The following is a piecewise function where the independent variable x is Taxable Income and the dependent variable y is Total Payable Tax.

The function is defined by 12 equations because there are 12 tax brackets. Each equation has the same format:

$$y = a + (x-L) * b$$

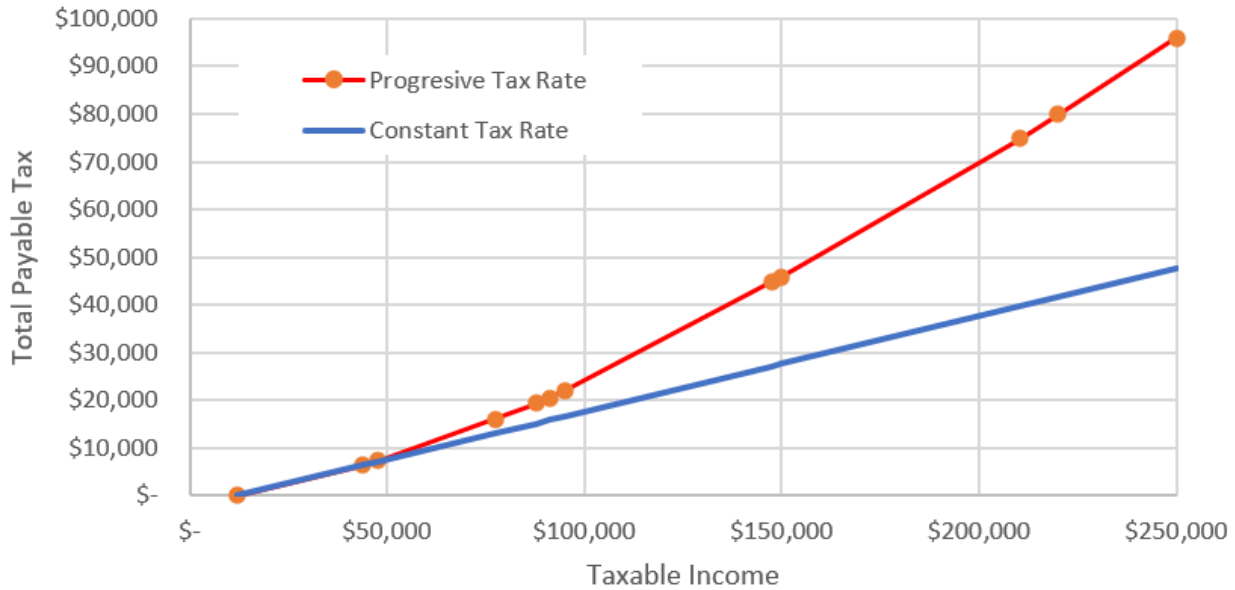
where

- **a** is the cumulative tax payable as per the table in the problem above
- **b** is the tax rate in each tax bracket as per the table in the problem above
- **L** is the lower bound of the tax bracket

Function $y = a + (x - L) * b$	Domain of x
$y = \$0.0$	$x \leq \$12,069$
$y = (x - \$12,069.0) * 20.05\%$	$\$12,069 < x \leq \$43,906$
$y = \$6,383.32 + (x - \$43,906.0) * 24.15\%$	$\$43,906 < x \leq \$47,630$
$y = \$7,282.66 + (x - \$47,630.0) * 29.65\%$	$\$47,630 < x \leq \$77,313$
$y = \$16,083.67 + (x - \$77,313.0) * 31.48\%$	$\$77,313 < x \leq \$87,813$
$y = \$19,389.07 + (x - \$87,813.0) * 33.89\%$	$\$87,813 < x \leq \$91,101$
$y = \$20,503.38 + (x - \$91,101.0) * 37.91\%$	$\$91,101 < x \leq \$95,259$
$y = \$22,079.68 + (x - \$95,259.0) * 43.41\%$	$\$95,259 < x \leq \$147,667$
$y = \$44,829.99 + (x - \$147,667.0) * 46.41\%$	$\$147,667 < x \leq \$150,000$
$y = \$45,912.73 + (x - \$150,000.0) * 47.97\%$	$\$150,000 < x \leq \$210,371$
$y = \$74,872.70 + (x - \$210,371.0) * 51.97\%$	$\$210,371 < x \leq \$220,000$
$y = \$79,876.89 + (x - \$220,000.0) * 53.53\%$	$\$220,000 < x$

The above piecewise function is plotted in red below, in the x (Taxable Income) and y (Total Payable Tax) system of coordinates for values of x from 0 to \$250,000. The plot also includes a blue straight line that shows Total Payable Tax if the same lowest tax rate of 20.05% was applied to all the tax brackets, i.e. the tax rate was constant. The steepening red line when compared to the blue line illustrates the concept of progressive taxation in Canada.

Total Payable Tax (federal plus provincial) on Taxable Income for Ontario Residents in 2019



## Terms of Service

FinStart's goal is to educate.

The information on the Site is provided for general information only and is not exhaustive. We aim to update the Site as needed. However, the information can change without notice we cannot guarantee that it will always be accurate and error-free. Please do your own research to verify for yourself the ideas you find on this Site.

FinStart © not a financial services firm. The information on this Site does not constitute advice of any kind and does not nor should it replace competent financial services, legal, accounting and other professional advice. Please do not rely on this information to make financial or investment decisions and seek independent advice as required for your purposes.

We do not warrant that your use of the Site, the operation or function of the Site, or any services offered through or from the Site, will be uninterrupted, that defects will be corrected, or that this Site or its server are free of viruses or other harmful elements.

Therefore, FinStart or its contributors shall not be liable for any damages related to your use or inability to use this Site, including without limitation direct, indirect, special, compensatory or consequential damages, lost profits or loss of or damage to property.

If you are dissatisfied with the Site, any of its contents, or any of our terms, kindly contact us directly.

**Proprietary Materials.** The website and all associated educational resources are owned and operated by FinStart.ca. The visual interfaces, graphics, design, compilation, information, computer code (including source code or object code), software, services, content, educational videos and exercises, lesson plans, and all other elements are protected by Canadian and international copyright, patent, and trademark laws, international conventions, and other applicable laws governing intellectual property and proprietary rights. Except for any user content provided and owned by users, all content and trademarks, service marks, and trade names, contained on or available through the website are owned by or licensed to FinStart.ca.

**Licensed Educational Content.** FinStart.ca may make available on the Website certain educational videos, exercises, and related supplementary materials that are owned by it or its third-party licensors. FinStart.ca may grant to you in writing a non-exclusive, non-transferable right to access and use such content solely for agreed-upon one-time non-commercial use in a specified classroom setting.

**Crediting FinStart.ca.** If you distribute, publicly perform or display, transmit, publish, or otherwise make available any licensed educational content or any derivative works thereof, you must also provide prominently the following notice: "All FinStart content is available for free at [www.finstart.ca](http://www.finstart.ca)".

**Third-Party Sites, Products and Services.** The website may include links or references to other web sites or services solely as a convenience to users. FinStart.ca does not endorse any such reference sites or the information, materials, products, or services contained on or accessible through them. Access and use of reference sites, including the information, materials, products, and services on or available through reference sites is solely at your own risk.

**No Warranties.** The website, and all data, information, software, website materials, content, user content, reference sites, lesson plans, additional educational resources, services, or applications made available in conjunction with or through the website, are provided on an "as is", "as available", and "with all faults" basis. To the fullest extent permissible pursuant to applicable laws, FinStart.ca and its affiliates and licensors, disclaim any and all warranties and conditions, whether statutory, express or implied, including, but not limited to, all implied warranties of merchantability, fitness for a particular purpose, title, and non-infringement. No advice or information, whether oral or written, obtained by you from FinStart.ca or through the website will create any warranty not expressly stated herein.

**Content.** FinStart.ca, and its suppliers, licensors, and affiliates, do not warrant that the website or any data, user content, functions, or any other information offered on or through the website will be uninterrupted, or free of errors, viruses or other harmful components, and do not warrant that any of the foregoing will be corrected.

**Harm to Your Computer.** Users understand and agree that their use, access, download, or otherwise obtaining of content, website materials, software, or data through the website (including through any APIs) is at their own discretion and risk, and that they will be solely responsible for any damage to their property (including their computer systems) or loss of data that results therefrom.

**FinStart for Teachers.** FinStart makes available certain resources to teachers who register with us such that they can use them to work with students in order to provide such students with tutorial or educational services as part of the school's curriculum or as an extra-curricular activity, and to review and evaluate educational achievement and progress of such students. If you are accessing our resources on behalf of a school, school district, or any educational institution, the following terms apply to you:

- (a) **Limitations on Use.** FinStart's website and resources are provided to you for educational purposes as part of the school curriculum. You must use them in compliance with all applicable laws, rules, and regulations. You agree not to reproduce, duplicate, copy, sell, resell or otherwise exploit for any commercial purpose, any portion of our website or any resources we share with you.
- (b) **Responsibility for Consent and Notices.** You and your school assume sole responsibility for obtaining any consents required from parents or guardians, and for providing appropriate disclosures to users and their parents regarding their use of our resources and our terms of use. You agree to be bound by these terms. Specifically you agree, individually and on behalf of the institution, that:
  - (i) You assume sole responsibility for providing appropriate notices and disclosures to students accessing our resources for classroom use and their parents regarding the students' use of our website and any resources we share with you and our terms.
  - (ii) You assume sole responsibility for obtaining any consents required from parents or guardians in connection with accessing our website and other resources for classroom use. You represent and warrant to FinStart that, prior to using our website and resources with students, you have either obtained all necessary parent or guardian consents, or have complied and will comply with all applicable requirements of an exemption from or exception to parental consent requirements.
- (c) **Use of Integrated Services.** If you choose to allow your students to use another service, such as Google Classroom, in conjunction with using FinStart's website and other resources, you are responsible for educating your students on the proper use of integrated services.