

CHAPTER 1

NUMBER CONCEPTS AND OPERATIONS

1.1 Representing and Describing Whole Numbers

1.2 Using Estimation

1.3 Mental Mathematics for Multiplying

1.4 Multiplying 2-Digit Numbers

1.5 Dividing 2-Digit by 1-Digit Numbers

If you need additional help, there are more resources available at math-help.ca/more



Examples:

- | | |
|------------------------------------|--|
| 1. Use 35 172 instead of 35,172. | Leave a space with three digits to the right. |
| 2. Use 534 873 instead of 534,873. | Leave a space with three digits to the right. |
| 3. Use 4215 instead of 4,215. | Since there are only 4 digits, do not leave a space. |

Examples with Solutions

1. Write a numeral for each of the following word numbers.

- | | |
|--|--------|
| a. two hundred fifty-three | 253 |
| b. one hundred twenty | 120 |
| c. three thousand four hundred seventy | 3470 |
| d. six thousand fifty-seven | 6057 |
| e. five thousand six hundred two | 5602 |
| f. fifty thousand three hundred six | 50 306 |

2. Write a word number for each of the following numerals.

- | | |
|-----------|---|
| a. 509 | five hundred nine |
| b. 3238 | three thousand two hundred thirty-eight |
| c. 4044 | four thousand forty-four |
| d. 6305 | six thousand three hundred five |
| e. 8230 | eight thousand two hundred thirty |
| f. 41 206 | forty-one thousand two hundred six |

3. Write as many different numerals as possible from the following digits.

7, 3

Possible numerals with one digit are 3 and 7.

Possible numerals with two digits are 37 and 73.

All possible numerals are: 3, 7, 37, 73.

4. Use proper spacing and delete commas to rewrite each numeral shown incorrectly on the left.

Incorrectly Written NumeralCorrect Version

- | | |
|------------|--------------------------------------|
| a. 4,678 | 4678 (remove comma, no space) |
| b. 7 349 | 7349 (remove space) |
| c. 10,348 | 10 348 (remove comma, insert space) |
| d. 72,431 | 72 431 (remove comma, insert space) |
| e. 145,689 | 145 689 (remove comma, insert space) |

Place Value

When we write numerals from 0 to 9, they involve only the “**ones**” digits.

Examples:

1. 9 is equal to nine ones.
2. 2 is equal to two ones.

When we write numerals from 10 to 99, they involve both “**tens**” and “**ones**” digits.

Examples:

1. 16 is equal to 1 ten and 6 ones.
2. 68 is equal to 6 tens and 8 ones.

When we write numerals between 100 and 999, they involve **hundreds**, **tens**, and **ones** digits.

Example: 962 is equal to 9 hundreds, 6 tens, and 2 ones.

Numerals between 1000 and 99 999 can include the “**ten thousands**, **thousands**, **hundreds**, **tens**, and **ones**” digits. The number 23 417 is shown below with the place value for each digit.

2	3	4	1	7
↑	↑	↑	↑	↑
ten	thousands	hundreds	tens	ones
thousands				

So 23 417 has 2 ten thousands, 3 thousands, 4 hundreds, 1 ten, and 7 ones
(twenty-three thousand four hundred seventeen)

↑

Combine the thousands.

↑

Combine the tens and ones.

Examples with Solutions

1. What is the value of the underlined digit in each of the following numerals?

- | | |
|-------------------|---|
| a. <u>4</u> 53 | The digit 5 is in the tens place, so it is equal to $5 \times 10 = 50$. |
| b. 6 <u>8</u> 2 | The digit 2 is in the ones place, so it is equal to $2 \times 1 = 2$. |
| c. <u>5</u> 09 | The digit 5 is in the hundreds place, so it is equal to $5 \times 100 = 500$. |
| d. <u>2</u> 345 | The digit 3 is in the hundreds place, so it is equal to $3 \times 100 = 300$. |
| e. <u>5</u> 230 | The digit 5 is in the thousands place, so it is equal to $5 \times 1000 = 5000$. |
| f. <u>5</u> 4 895 | The digit 4 is in the thousands place, so it is equal to $4 \times 1000 = 4000$. |
| g. <u>2</u> 4 305 | The digit 2 is in the ten thousands place, so it is equal to $2 \times 10\ 000 = 20\ 000$. |

2. Write each numeral described below.

- | | |
|--|--------|
| a. I have 5 tens, 4 hundreds, and 3 ones. | 453 |
| b. I have 2 thousands, 3 hundreds and 7 ones. | 2307 |
| c. I have 9 hundreds, 7 thousands, and 8 ones. | 7908 |
| d. I have 6 ten thousands and 2 hundreds. | 60 200 |
| e. I have 3 ten thousands, 1 thousand, and 5 tens. | 31 050 |
| f. I have 6 thousands and 3 ones. | 6003 |
| g. I have 3 hundreds and 7 thousands. | 7300 |

3. Write each numeral as a word number.

- | | |
|------------|--|
| a. 25 040 | Twenty-five thousand forty |
| b. 620 305 | six hundred twenty thousand three hundred five |
| c. 702 027 | seven hundred two thousand twenty-seven |
| d. 800 808 | eight hundred thousand eight hundred eight |

4. Write each word number as a numeral.

- | | |
|---|---------|
| a. three hundred twenty-five thousand two hundred nine | 325 209 |
| b. one hundred twenty-five thousand six hundred forty-eight | 125 648 |
| c. two hundred thousand three hundred ten | 200 310 |
| d. six hundred thousand thirty-five | 600 035 |

Expressing a Numeral using Expanded Form

We can show a numeral as a sum of the values of its digits. This is called writing the numeral in **expanded form**. For example, 526 is equal to $500 + 20 + 6$. Keep in mind the place values of the digits.

Examples:

1. $34 = 3 \times 10 + 4 \times 1 = 30 + 4$
2. $793 = 7 \times 100 + 9 \times 10 + 3 \times 1 = 700 + 90 + 3$
3. $8408 = 8 \times 1000 + 4 \times 100 + 0 \times 10 + 8 \times 1 = 8000 + 400 + 8$

Examples with Solutions

1. Write each numeral in expanded form.

a. 5642

$$5642 = 5 \times 1000 + 6 \times 100 + 4 \times 10 + 2 \times 1$$

b. 4059

$$4059 = 4 \times 1000 + 5 \times 10 + 9 \times 1$$

c. 24 040

$$24\ 040 = 2 \times 10\ 000 + 4 \times 1000 + 4 \times 10$$

2. Write the numeral that has 5 thousands, 2 hundreds, 3 tens, and 0 ones.

$$\begin{aligned} & \underline{5} \times 1000 + \underline{2} \times 100 + \underline{3} \times 10 + \underline{0} \times 1 \\ & = 5000 + 200 + 30 + 0 = 5230 \end{aligned}$$

3. Write the word number for the numeral **7215**.

The numeral has 7 thousands, 2 hundreds, 1 ten, and 5 ones.

The word number is **seven thousand two hundred fifteen**.

4. Write 30 574 in words.

The numeral has 3 ten thousands, 5 hundreds, 7 tens, and 4 ones.

The word number is **thirty thousand five hundred seventy-four**.

5. Write three hundred thousand five hundred twenty as a numeral.

There are 3 hundred thousands, 5 hundreds, and 2 tens.

The numeral is **300 520**.

6. In the numeral 70 218,

a. What is the value of the 2?

The 2 is in the hundreds column, so its value is $2 \times 100 = 200$.

- b. What is the value of the 1? The one is in the tens column, so its value is $1 \times 10 = 10$.
- c. What is the value of the 7? The 7 is in the ten thousands column, so its value is $7 \times 10\,000 = 70\,000$.

Exercises 1.1

- Write a numeral for each of the following word numbers.
 - one hundred seventy
 - five hundred nine
 - four hundred twenty-four
 - six thousand fifteen
 - two thousand thirty-six
 - twenty-two thousand ten
 - thirty thousand two hundred one
 - two hundred thousand six hundred
- Write a word number for each of the following numerals.
 - 345
 - 304
 - 1250
 - 2253
 - 32 753
 - 70 150
 - 125 344
 - 333 303
- Write as many different numerals as possible from the following digits.
 - 5, 2
 - 1, 7
- Rewrite each numeral using proper spacing and deleting commas.
 - 4 790
 - 7,666
 - 5,555
 - 12,456

e. 30,148

f. 22,088

g. 470,031

h. 330,022

5. Fill in each blank with the correct digit in the table below.

	ten thousands	thousands	hundreds	tens	ones
a. 405					
b. 2210					
c. 6070					
d. 5055					
e. 20 245					
f. 31 042					
g. 78 103					

6. Write each numeral using expanded notation.

a. 4522

b. 3022

c. 40 250

d. 12 090

e. 38 0 80

f. 120 790

7. Write each numeral described below.

a. I have 3 thousands, 2 tens, and 7 ones.

b. I have 6 hundreds and 9 ones.

c. I have 2 ten thousands, 3 hundreds, 5 tens, and 2 ones.

d. I have 8 thousands, 3 tens, and 5 ones.

8. What is the value of the digit underlined in each numeral?

a. 5671b. 6092

c. $\underline{6}3\ 697$ d. $\underline{5}4\ 207$

9. Draw an arrow to match the numeral on the left with the correct word number on the right. The first one is done for you.

- a. $125\ 430$ → nine hundred eight thousand eight
- b. $750\ 209$ → one hundred twenty-five thousand four hundred thirty
- c. $300\ 025$ → four hundred ten thousand ten
- d. $908\ 008$ → seven hundred fifty thousand two hundred nine
- e. $410\ 010$ → three hundred thousand twenty-five
- f. $125\ 043$ → three hundred thousand two hundred fifty
- g. $300\ 250$ → one hundred twenty-five thousand forty-three

Extra for Experts**WHAT NUMBER AM I?**

10. I have 3 thousands, 2 hundreds, 0 tens, and 2 ones.
11. I have 2 hundreds, three times as many tens as hundreds, and half as many ones as hundreds.
12. I have 15 ones and 9 tens.
13. I have 30 tens and 2 ones.

14. I have 14 hundreds, 6 tens, and 18 ones.

15. I have twice as many thousands as tens, twice as many tens as ones, and 2 less than 4 ones.

16. I have 6 thousands, half as many hundreds as thousands, and the same number of tens and ones as hundreds.

17. I have the same number of thousands, hundreds, tens, and ones. The sum of my digits is 28.

18. List all of the 3-digit numerals that can be made from the digits 3, 6, and 9.

19. List all of the numerals containing one, two, or three digits that can be made from the digits 5, 2, and 3.

ANSWERS TO EXERCISES AND CHAPTER TESTS

CHAPTER 1

Exercises 1.1 (page 7)

1. a) 170 b) 509 c) 424 d) 6015 e) 2036
 f) 22 010 g) 30 201 h) 200 600
 2. a) three hundred forty-five
 b) three hundred four
 c) one thousand two hundred fifty
 d) two thousand two hundred fifty-three
 e) thirty-two thousand seven hundred fifty-three
 f) seventy thousand one hundred fifty
 g) one hundred twenty-five thousand three hundred forty-four
 h) three hundred thirty-three thousand three hundred three
 3. a) 2, 5, 25, 52 b) 1, 7, 17, 71
 4. a) 4790 b) 7666 c) 5555 d) 12 456
 e) 30 148 f) 22 088 g) 470 031 h) 330 022
 5. a) 0 0 4 0 5 b) 0 2 2 1 0 c) 0 6 0 7 0
 d) 0 5 0 5 5 e) 2 0 2 4 5 f) 3 1 0 4 2
 g) 7 8 1 0 3
 6. a) $4 \times 1000 + 5 \times 100 + 2 \times 10 + 2 \times 1$
 b) $3 \times 1000 + 2 \times 10 + 2 \times 1$
 c) $4 \times 10\ 000 + 2 \times 100 + 5 \times 10$
 d) $1 \times 10\ 000 + 2 \times 1000 + 9 \times 10$
 e) $3 \times 10\ 000 + 8 \times 1000 + 8 \times 10$
 f) $1 \times 100\ 000 + 2 \times 10\ 000 + 7 \times 100 + 9 \times 10$
 7. a) 3027 b) 609 c) 20 352 d) 8035
 8. a) 600 b) 90 c) 3000 d) 50 000
 9.
 a. 125 430
 b. 750 209
 c. 300 025
 d. 908 008
 e. 410 010
 f. 125 043
 g. 300 250
- nine hundred eight thousand eight
 one hundred twenty-five thousand four hundred thirty
 four hundred ten thousand ten
 seven hundred fifty thousand two hundred nine
 three hundred thousand twenty-five
 three hundred thousand two hundred fifty
 one hundred twenty-five thousand forty-three
10. 3202 11. 261 12. 105 13. 302 14. 1478
 15. 8042 16. 6333 17. 7777
 18. 369, 396, 639, 693, 936, 963 19. 2, 3, 5, 23, 32, 25, 52, 35, 53, 523, 532, 253, 235, 352, 325

Exercises 1.2 (page 15)

1. a) 500 b) 11 000 c) 3600 d) 300 e) 20
 2. a) $6700 + 10000 = 7900$ b) $3400 + 700 = 4100$ c) $3200 - 2100 = 1100$ d) $4300 - 400 = 3900$ e) $230 \times 10 = 2300$ f) $450 \div 5 = 90$
 3. a) $500 + 3400 = 3900$ b) $6400 - 400 = 6000$ c) $40 \times 40 = 1600$ d) $260 \div 20 = 13$ 4. a) 60 b) 90 c) 200 d) 12 200 e) 19 000 f) 2540 g) 72 000 h) 1660 i) 90 900 j) 191 920 k) 65 000 5. a) 30×40 ; 1200 b) 100×300 ; 30 000 c) 50×100 ; 5000 d) 300×300 ; 90 000 e) 1000×100 ; 100 000 6. $300 + 300 + 600$; 1200 7. $500 + 600 + 500 + 600$; 2200 km
 8. $40 + 60 + 70 + 110$; 280 tickets
 9. $300 + 500 + 200 + 500$; 1500 cards
 10. $70 + 70 + 40 + 70 + 90 + 90 + 90 + 60$; 580 students 11. 15 675, 15 676, 15 677, 15 678, 15 679 12. 1, 2, 3, 4 13. Round 21 months down to 20 and round the number of days in each month to 30. $30 \times 20 = 600$
 14. a) 35, 36, 37, 38, 39 40, 41, 42, 43, 44 b) 8550, 8551, 8552, 8553, 8554, 8555
 15. a) 9842 b) 2489

Exercises 1.3a (page 19)

1. a) 24, 30 b) 32, 48, 56 c) 28, 35
 d) 18, 24, 27 e) 16, 28, 32, 36
 f) 10, 14, 16, 18 g) 63, 72 h) 48, 54
 2.

7	\times	8	=	56	
6	\times	7	=	42	
3	\times	4	=	12	
5	\times	7	=	35	
8	\times	3	=	24	
4	\times	7	=	28	
2	\times	9	=	18	
8	\times	8	=	64	
7	\times	7	=	49	
9	\times	5	=	45	
4	\times	9	=	36	
8	\times	7	=	56	
8	\times	9	=	72	