Name: _____

Class: _____

CANADIAN MATHEMATICS

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CANADIAN MATHEMATICS 7 - TABLE OF CONTENTS

CHAPTER 8 - DECIMALS

CHAPTER 9 - EQUATIONS (RATIONALS)

CHAPTER 10 - RATE, RATIO & PERCENT

CHAPTER 11 - EXPONENTS

CHAPTER 12 - GEOMETRY

CHAPTER 13 - MOTION GEOMETRY

CHAPTER 14 - MEASUREMENT

CHAPTER 15 - DATA MANAGEMENT

CHAPTER 1 - WHOLE NUMBERS (W)

1.1 PLACE VALUE OF WHOLE NUMBERS

Numbers are written by using the digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.

If we look at the numbers, 384 and 452, the '**4**' in each number looks the same (**face value**) but each has a different meaning (**place value**).

In the number 3 528 917 below, we see that numbers have different values depending upon where they are placed in a string of numbers.

3 millions	**5** hundred-thousands	**2** ten-thousands	**8** thousands	**9** hundreds	**1** tens	**7** ones or units

The number in the boxes above in **word form** would be:
three million, five hundred twenty-eight thousand, nine hundred seventeen.

Place value and **face value** are used to determine whether one number is larger or smaller than another number. An example of this is as follows:

EXAMPLE:

Is 735 less than (<) or greater than (>) 794?

Starting from the left, we find that the numbers in the hundreds place are the same, but as we continue to the right and look at the numbers in the tens place, we see that the 9 is greater than the 3.

∴ we conclude that 735 < 794.

A. What is the place value of the 8 in each number?

1. 38 446 _____
2. 9684 _____
3. 8 400 766 _____
4. 8 000 000 000 _____
5. 49 809 _____
6. 5 123 968 _____
7. 855 644 _____
8. 84 _____
9. 583 022 _____
10. 98 423 _____

B. Write each in word form.

1. 4476
2. 201
3. 7800
4. 3 000 987
5. 476 124
6. 505
7. 3 800 000 000
8. 6 954 638

C. Place a less than sign (<) or a greater than sign (>) in the circle between each pair of numbers to make a true statement.

1. 869 ◯ 843
2. 83 435 ◯ 83 454
3. 3245 ◯ 7635
4. 769 ◯ 679
5. 4582 ◯ 4852
6. 70 352 ◯ 7352
7. 654 345 ◯ 655 987
8. 74 369 ◯ 79 421
9. 457 753 ◯ 449 999
10. 6543 ◯ 5643

D. Arrange each set of numbers from greatest to least.

1. 388, 453, 296, 487
2. 705, 507, 750, 570
3. 817, 718, 187, 178
4. 3006, 3060, 3600
5. 404, 440, 489, 498
6. 20 350, 23 005, 20 035
7. 3033, 3303, 3330, 3003
8. 56 009, 50 960, 59 690, 59 960, 56 990
9. 45 903, 49 503, 43 903, 49 530
10. 4608, 4806, 4680, 4860, 4086

1.2 EXPANDED & STANDARD FORM OF WHOLE NUMBERS

When a number is written in the form 67 532, we call this **standard form**. We can also write this number in **expanded form** which shows the place value of each digit as shown in the examples in the chart below:

Standard Form	Expanded Form
4352	$(4 \times 1000) + (3 \times 100) + (5 \times 10) + (2 \times 1)$
72 043	$(7 \times 10\,000) + (2 \times 1000) + (0 \times 100) + (4 \times 10) + (3 \times 1)$

(Note: You may leave out the zero digits in the expanded form, but you must include the zeros in the standard form.)

A. Write each in expanded form.

1. 58
2. 12 212
3. 3066
4. 6000
5. 234 008
6. 9 420 405
7. 300 002
8. 77 100

B. Write each in standard form.

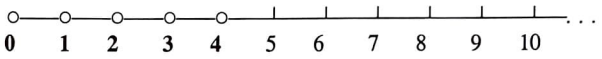
1. $(4 \times 10\,000) + (9 \times 1000) + (5 \times 100) + (6 \times 1)$
2. $(6 \times 100\,000) + (6 \times 100)$
3. $(3 \times 1000) + (7 \times 100) + (9 \times 10) + (6 \times 1)$
4. $(7 \times 1\,000\,000) + (8 \times 100\,000) + (6 \times 10\,000)$
5. $(7 \times 1000) + (8 \times 10) + (5 \times 1)$
6. $(8 \times 10\,000) + (2 \times 1000) + (3 \times 100)$
7. $(5 \times 1) + (7 \times 10) + (8 \times 100) + (3 \times 1000)$
8. $(4 \times 100) + (8 \times 10\,000) + (4 \times 1) + (7 \times 1000)$

1.3 GRAPHING WHOLE NUMBERS

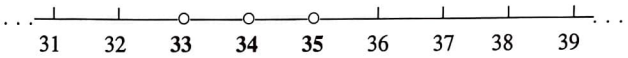
We can use a **number line** to graphically show any whole number. The examples below illustrate graphs where one and/or two conditions must be met.

EXAMPLES: Graph the following:

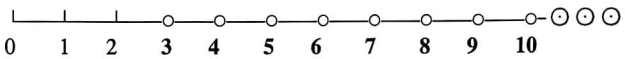
1. All whole numbers less than 5



2. All whole numbers > 32 and < 36



3. All the whole numbers > 2



A. Graph the following.

1. All whole numbers

2. All the natural numbers less than 7

3. All whole numbers greater than 5 but less than 8

4. All whole numbers less than 1

5. All whole numbers > 78

6. All the natural numbers

7. The set of odd numbers

8. The set of natural numbers < 6

9. The set of even numbers greater than 48

1.4 ROUNDING & ESTIMATION WITH WHOLE NUMBERS

In our everyday lives we do not always need exact numbers or exact calculations. We often use **estimations** that we get by **rounding off** numbers.

Examples of this are: 1. A marine biologist estimates that there are 3 000 000 jack-fish in a lake, 2. We estimate that our total grocery bill will be $75 before we get to the check-out, 3. We estimate our vacation expenses before we go on vacation as shown below.

EXPECTED VACATIONEXPENSES FOR A ONE WEEK PERIOD		
FOOD	$300 (more or less)	It would be impossible to calculate the actual cost before the trip, so we use estimates.
GASOLINE	$200 (hopefully ?)	
LODGING	$350 (reservations)	
SPENDING $	$500 (more or less)	
GIFTS	$400 (?)	
TOTAL	**$1750 (approximate)**	

If an exact answer is required, an estimate should be done first. We do this by first rounding off the numbers and calculating before we do the calculations with the actual numbers. This will provide us with a good indication if our answer is logical and/or correct. The chart below shows the rules and an example for rounding off numbers.

RULES FOR ROUNDING OFF NUMBERS	EXAMPLE : Round 8347 to the nearest 10
1. Find the number that is in the target place,(the **tens** place or the **4** in this example) because this is the number that will be affected.	83<u>4</u>7 (The **4** is in the tens place.)
2. If the number after our target number is a 0, 1, 2, 3 or 4, then the target number stays the same.	834<u>7</u> (The **7** is in the ones place.)
3. If the number after our target number is a 5, 6, 7, 8 or 9, then the target number increases by one. (In our example the number is a **7**, so the **4** now becomes a **5**.)	∴ **8347 becomes 8350**

A. Round each off to the indicated place.

1. 746 to the nearest 10
2. 14 563 to the nearest 100
3. 14 563 to the nearest 1000
4. 963 to the nearest 100
5. 963 to the nearest 1000
6. 543 456 to the nearest 100
7. 76 432 to the nearest 100
8. 34 999 to the nearest 10

B. Complete the following chart.

Round to the nearest:	100	10 000	10	1	1000
763 852					
14 273					
3 590					
53					
1364					
765 891					
3421					
542 867					

C. The area of all the Canadian provinces and territories is given below. Round each to the nearest 100 km^2 and then to the nearest 1000 km^2.

PROVINCES	ACTUAL AREA	100 km^2	1000 km^2
British Columbia	948 597 km^2		
Alberta	661 185 km^2		
Saskatchewan	651 900 km^2		
Manitoba	650 087 km^2		
Ontario	1 068 583 km^2		
Quebec	1 540 681 km^2		
Nova Scotia	55 491 km^2		
New Brunswick	73 436 km^2		
Newfoundland	404 517 km^2		
P.E.I.	5 657 km^2		
N.W.T. & Nunavut	3 379 686 km^2		
Yukon Territories	482 515 km^2		