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**ESSENTIAL  
EXERCISES**

**YEAR 4**

**M A T H S**

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**NOTE:** The New Australian National Curriculum has been split into 3 major strands:

Ⓐ Number & Algebra

Ⓑ Measurement & Geometry

Ⓒ Statistics & Probability

In the Year 4 content descriptions, these 3 major strands have been further subdivided into the sub-strands shown above.

## THE NEW NATIONAL AUSTRALIAN CURRICULUM

The authors acknowledge the dedicated work of the Australian Curriculum Assessment and Reporting Authority (ACARA), and the many who have contributed to the development of the Australian curriculum in response to the aims of the 2008 Melbourne declaration on Educational Goals for Young Australians.

**This book provides a summary and interpretation of their guidelines for those interested in developing mathematical understanding in Year 4 students.**

The Australian National Curriculum, developed by ACARA, states that, by the end of Year 4, students should be able to do the following:

- recall multiplication facts up to  $10 \times 10$  and related division facts.
- be familiar with collections up to 10 000.
- recognise and locate familiar fractions on a number line and make connections between fraction and decimal notations.
- solve problems by using relevant number sentences involving the four operations.
- convert between units of time and solve problems involving time duration.
- compare areas of regular and irregular shapes.
- classify angles.
- create symmetrical patterns.
- interpret the information contained in maps.
- describe the probabilities of everyday events.
- investigate different methods for data collection, construct data displays and evaluate their effectiveness.

### THE MATHEMATICS CURRICULUM OPERATES ON ANOTHER LEVEL, THE SO CALLED PROFICIENCY LEVEL.




The Proficiency strands at this level include:

1. **Understanding:** the connecting of number calculations with counting sequences, partitioning and counting numbers flexibly, identifying and describing the relationship between addition and subtraction and between multiplication and division.
2. **Fluency:** the counting of numbers in sequences readily, using units iteratively to compare measurements, listing possible outcomes of chance events, describing and comparing time durations.
3. **Problem solving:** this includes formulating problems from authentic situations, making models and using number sentences that represent problem situations, planning routes on maps, and matching transformations with their original shape.
4. **Reasoning:** using known facts to derive strategies for unfamiliar calculations, comparing and contrasting related models of operations, describing connections between 2-D and 3-D representations, and creating and interpreting simple representations of data.

Understanding, Fluency, Problem Solving and Reasoning are a central part of Mathematics content across the three major strands as mentioned earlier (Number and Algebra, Measurement and Geometry, and Statistics and Probability).

## NUMBER AND PLACE VALUE (Part 1)

The "Australian Curriculum Mathematics" (ACM) references for this sub-strand of "Number and Algebra" (NA) are below:

-  Investigate and use the properties of odd and even numbers (ACMNA 071).
-  Recognise, represent and order numbers to at least tens of thousands (ACMNA 072).
-  Apply place value to partition, rearrange and regroup numbers to at least tens of thousands to assist calculations and solve problems (ACMNA 073).

### ◆ EVEN NUMBERS AND ODD NUMBERS

2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, etc.  
Even numbers, always end in 2, 4, 6, 8, or 0.

1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, etc.  
Odd numbers always end in 1, 3, 5, 7, or 9.

Houses are usually numbered even on one side of the street, and numbered odd on the other side of the street.



### ◆ SOME PROPERTIES OF ODD AND EVEN NUMBERS

Listed below are some properties or rules relating to the addition of odd and even numbers.

If we add an even number to an even number, we will get an even answer.

If we add an even number to an odd number, we will get an odd answer.

If we add two odd numbers together, we will always get an even answer.

even + even = even  
even + odd = odd  
odd + odd = even

If you know these rules, then it can help you check your answers.



**Note:** See if you can discover the rules for subtracting, multiplying and dividing even and odd numbers.

### ◆ PLACE VALUE

The value of a digit depends on its position or place in the numeral.

In 8 174 the 7 has the value of 7 tens = 70.

In 8 147 the 7 has the value of 7 ones = 7.

In 7 814 the 7 has the value of 7 thousands = 7 000.

In 4 718 the 7 has the value of 7 hundreds = 700.

In 573 281 the 7 has the value of 7 ten thousands = 70 000.

It is extremely important to understand that our number system is based on PLACE VALUE!



### ◆ ASCENDING AND DESCENDING ORDER

To write a set of numbers in DESCENDING ORDER means to write them in order from the highest number to the lowest number.

To write a set of numbers in ASCENDING ORDER means to write them in order from the lowest number to the highest number.

**Example:** Write the numbers 38 761, 37 861, 36 871 and 37 681 in ascending order.

36 871, 37 681, 37 861, 38 761

## EXPANDED NOTATION

This means to rewrite the number as an addition sentence using tens of thousands, thousands, hundreds, tens and units.

$$58\ 736 = (5 \times 10\ 000) + (8 \times 1\ 000) + (7 \times 100) + (3 \times 10) + (6 \times 1)$$

$$740\ 829 = (7 \times 100\ 000) + (4 \times 10\ 000) + (8 \times 100) + (2 \times 10) + (9 \times 1)$$

## ROUNDING OFF

In some situations in Maths, particularly when using a calculator, we do not require the exact answer, but an approximate answer only. The question will then ask you to **ROUND OFF** the given number to the nearest ten, nearest hundred or nearest thousand.

### Example:

If we round off 73 to the nearest ten, then

the answer is 70, because 73 is closer to 70 than it is to 80.

if we round off 659 to the nearest hundred, then the answer is 700, because 659 is closer to 700 than it is to 600.

If we round off 3 500 to the nearest thousand, then the answer is 4000, because 500 is always rounded up.

Numbers ending in 5, or 50, or 500 are always rounded up!!



## ESTIMATING

When using a calculator, you will be surprised how easy it is to press the wrong button and then get a ridiculous answer which is way out from the correct answer. If we quickly and mentally estimate an approximate answer to begin with, then this will prevent us from making careless blunders.

Estimate the answer to  $469 + 1\ 728$

469 rounds off to 500.

1 728 rounds off to 1 700.

$$\begin{aligned} \text{Therefore estimate} &= 500 + 1\ 700 \\ &= 2\ 200 \end{aligned}$$

## ROMAN NUMERALS

When the Roman empire became powerful, its number system spread to many other countries. The system used a subtraction and addition idea. When a smaller unit appears before a larger one, it is subtracted from the larger one. When a smaller unit appears after the larger unit, it is added to the larger unit. Therefore the position of symbols is important.

IV means  $5 - 1 = 4$

whereas VI means  $5 + 1 = 6$

XL means  $50 - 10 = 40$

whereas LX means  $50 + 10 = 60$

1	2	3	4	5	6	7	8	9
I	II	III	IV	V	VI	VII	VIII	IX
10	20	30	40	50	60	70	80	90
X	XX	XXX	XL	L	LX	LXX	LXXX	XC
100	200	300	400	500	600	700	800	900
C	CC	CCC	CD	D	DC	DCC	DCCC	CM

1 000 = M

**Examples:** 94 = XCIV

47 = XLVII

849 = DCCCXLIX



For further reference, see 'Understanding Year 4 Maths' by W. Marlin


  
**Level 1**      **NUMBER AND PLACE VALUE**      **Easier**
  
**(Part 1)**

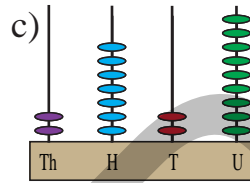
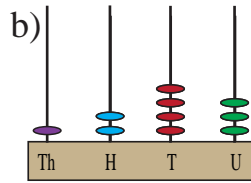
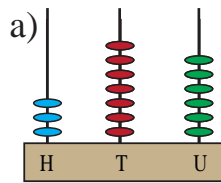
1. Circle all the even numbers.

55      78      180      189      236      344  
 263      391      410      727      1 360      3 628

Even numbers can be divided by 2.



2. Write the number shown on each abacus below, on the lines and also in the table.



Thousands	Hundreds	Tens	Units

\_\_\_\_\_

3. Write the following as ordinary numerals.

- a) Seventy three =
- b) Four hundred and twenty one =
- c) One thousand, five hundred and seven =
- d) Three thousand, two hundred and eighty five =

4. Are the answers odd or even? Write ODD or EVEN.

- a)  $8 + 10 =$
- b)  $5 + 7 =$
- c)  $4 + 9 =$

5. Arrange the numbers below in ascending order.

- a) 609, 1 019, 3 609, 906, 2 960 =
- b) 2 314, 3 241, 4 231, 1 423, 4 123 =
- c) 6 115, 566, 1 615, 5 615, 615 =
- d) 3 817, 738, 6 137, 1 387, 7 813 =

Ascending means from smallest to largest number.



6. Write the smallest possible even number using the digits given.

- a) 3, 2, 8
- b) 6, 2, 9
- c) 8, 5, 4

\_\_\_\_\_

7. What is the place value of the underlined digits?

- a) 91 →
- b) 123 →
- c) 584 →
- d) 1 068 →
- e) 2 977 →
- f) 3 695 →

8. Write the following in standard form (short way).

- a)  $(3 \times 100) + (5 \times 10) + (2 \times 1) =$
- b)  $(6 \times 100) + (4 \times 10) + (3 \times 1) =$
- c)  $(9 \times 100) + (7 \times 10) + (8 \times 1) =$
- d)  $(1 \times 1\,000) + (1 \times 100) + (5 \times 10) + (7 \times 1) =$
- e)  $(2 \times 1\,000) + (2 \times 100) + (9 \times 10) + (9 \times 1) =$
- f)  $(4 \times 1\,000) + (3 \times 100) + (6 \times 10) + (5 \times 1) =$

9. Write the following in expanded notation.

- a) 95 →
- b) 310 →
- c) 908 →
- d) 3 456 →

10. Round off the numbers below to the nearest 10. The first one has been done for you.

- a) 52 → 50
- b) 71 →
- c) 99 →
- d) 88 →
- e) 114 →
- f) 243 →

Remember!  
The middle  
number is always  
rounded up.



11. Estimate the answers. First, round off the numbers to the nearest 10. The first one has been done for you.

- a)  $47 + 14 = 50 + 10 = 60$
- b)  $89 + 55 = \underline{\quad} + \underline{\quad} = \underline{\quad}$
- c)  $111 + 238 = \underline{\quad} + \underline{\quad} = \underline{\quad}$
- d)  $205 + 303 = \underline{\quad} + \underline{\quad} = \underline{\quad}$

12. Round off the numbers below to the nearest 100.

- a) 98 →
- b) 50 →
- c) 145 →
- d) 273 →
- e) 555 →
- f) 1 350 →

13. Change the Roman numerals to Hindu Arabic numerals (our number system).  
The first one has been done for you.

Remember! I = 1, V = 5, X = 10  
When a smaller unit appears before a larger unit, it is subtracted from the larger one. When a smaller unit appears after the larger unit, it is added to the larger unit.  
∴ IV means  $5 - 1 = 4$  but VI means  $5 + 1 = 6$

- a) IX =  $10 - 1 = 9$
- b) XVI =  $\underline{\quad} + \underline{\quad} + \underline{\quad} = \underline{\quad}$
- c) XXIX =  $\underline{\quad} + \underline{\quad} + (\underline{\quad} - \underline{\quad}) = \underline{\quad}$
- d) XXXV =  $\underline{\quad} + \underline{\quad} + \underline{\quad} + \underline{\quad} = \underline{\quad}$



Level  
2

NUMBER AND PLACE VALUE  
(Part 1)

Average



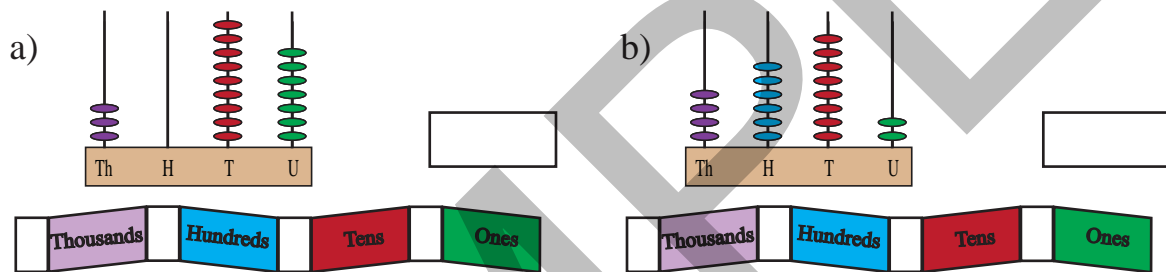
1. Write the next even number in each set.

- a) 40,       b) 188,       c) 1 576,       d) 2 314,

2. Write the next odd number in each set.

- a) 55,       b) 129,       c) 999,       d) 1 763,

3. Write the number shown on each abacus below, and fill in the numeral expander.



4. Write the following numerals in words.

- a) 878 →  
b) 2 054 →  
c) 4 361 →  
d) 5 890 →

5. Arrange the numbers below in descending order.

- a) 1 211, 2 111, 2 310, 3 211, 1 321 =  
b) 2 987, 3 459, 1 538, 5 834, 4 973 =  
c) 6 046, 4 057, 5 745, 3 746, 7 364 =  
d) 7 956, 9 765, 6 956, 5 659, 9 567 =

Descending means  
from largest to  
smallest number.



6. What is the place value of 7 in each number?

- a) 127 →      b) 1 279 →      c) 2 371 →  
d) 3 789 →      e) 4 317 →      f) 7 890 →

7. Write TRUE or FALSE. Write your answer on the line.

- a) even + even = odd      b) odd + odd = even      c) even + odd = odd
- \_\_\_\_\_



8. Write the largest possible odd number using the digits below.

a) 5, 6, 7

b) 6, 4, 3

c) 8, 1, 9

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

9. Write the following numbers in standard form.

a)  $(8 \times 100) + (7 \times 10) + (5 \times 1) =$

b)  $(3 \times 1\,000) + (3 \times 100) + (2 \times 10) + (4 \times 1) =$

c)  $(8 \times 1\,000) + (2 \times 100) + (9 \times 10) + (8 \times 1) =$

d)  $(9 \times 1\,000) + (7 \times 100) + (2 \times 10) + (9 \times 1) =$

10. Write the following numbers in expanded notation.

a) 2 915  $\rightarrow$

b) 4 817  $\rightarrow$

c) 6 723  $\rightarrow$

d) 8 625  $\rightarrow$

11. Round off the numbers to the nearest 100. The first one has been done for you.

a) 287  $\rightarrow$  300

b) 455  $\rightarrow$

c) 510  $\rightarrow$

d) 1 235  $\rightarrow$

e) 1 590  $\rightarrow$

f) 2 135  $\rightarrow$

12. Firstly, round off the numbers to the nearest 100. Then estimate the answer. The first one has been done for you.

a)  $198 + 81 = 200 + 100 = 300$

b)  $170 + 344 = \underline{\quad} + \underline{\quad} = \underline{\quad}$

c)  $469 + 445 = \underline{\quad} + \underline{\quad} = \underline{\quad}$

d)  $538 + 955 = \underline{\quad} + \underline{\quad} = \underline{\quad}$

13. Round off the numbers to the nearest 1 000. The first one has been done for you.

a)  $1\,916 = 2\,000$

b)  $1\,500 =$

c)  $2\,143 =$

d)  $596 =$

e)  $3\,375 =$

f)  $6\,678 =$

Don't forget to round up the middle number.



14. Change the Roman numerals to Hindu Arabic numerals (our number system). The first one has been done for you.

a) LXI =  $50 + 10 + 1 = 61$

b) LXXV =  $\underline{\quad} + \underline{\quad} + \underline{\quad} + \underline{\quad} = \underline{\quad}$

c) XLVI =  $(\underline{\quad} - \underline{\quad}) + \underline{\quad} + \underline{\quad} = \underline{\quad}$

d) LXXIX =  $\underline{\quad} + \underline{\quad} + \underline{\quad} (\underline{\quad} - \underline{\quad}) = \underline{\quad}$

e) CLXVI =  $\underline{\quad} + \underline{\quad} + \underline{\quad} + \underline{\quad} + \underline{\quad} = \underline{\quad}$

f) CXL =  $\underline{\quad} + (\underline{\quad} - \underline{\quad}) = \underline{\quad}$

Remember!  
I = 1, V = 5, X = 10  
L = 50, C = 100





These are the answers!

Level  
1

NUMBER AND PLACE VALUE  
(Part 1)

Easier

1. 78, 180, 236, 344, 410, 1 360, 3 628

2. Write the following numbers on the value chart shown.

Thousands	Hundreds	Tens	Units
	3	7	6
1	2	4	3
2	7	2	9

a) 376      b) 1 243      c) 2 729

3. a) 73      b) 421      c) 1 507      d) 3 285

4. a)  $8 + 10 = 18$  (EVEN)      b)  $5 + 7 = 12$  (EVEN)      c)  $4 + 9 = 13$  (ODD)

5. a) 609, 906, 1 019, 2 960, 3 609      b) 1 423, 2 314, 3 241, 4 123, 4 231  
c) 566, 615, 1 615, 5 615, 6 115      d) 738, 1 387, 3 817, 6 137, 7 813

6. a) 3, 2, 8  $\rightarrow$  328, 382, 283, 238, 832, 823 (The smallest even number is 238.)  
b) 6, 2, 9  $\rightarrow$  629, 692, 296, 269, 962, 926 (The smallest even number is 296.)  
c) 8, 5, 4  $\rightarrow$  854, 845, 548, 584, 485, 458 (The smallest even number is 458.)

7. a) 90      b) 3      c) 500      d) 60      e) 900      f) 5

8. a) 352      b) 643      c) 978      d) 1 157      e) 2 299      f) 4 365

9. a)  $95 = (9 \times 10) + (5 \times 1)$       b)  $310 = (3 \times 100) + (1 \times 10) + (0 \times 1)$   
c)  $908 = (9 \times 100) + (0 \times 10) + (8 \times 1)$       d)  $3 456 = (3 \times 1 000) + (4 \times 100) + (5 \times 10) + (6 \times 1)$

10. a) 50      b) 70      c) 100      d) 90      e) 110      f) 240

11. a)  $47 + 14 = 50 + 10$  (rounded to nearest 10) = 60 (estimate)  
b)  $89 + 55 = 90 + 60$  (rounded to nearest 10) = 150 (estimate)  
c)  $111 + 238 = 110 + 240$  (rounded to nearest 10) = 350 (estimate)  
d)  $205 + 303 = 210 + 300$  (rounded to nearest 10) = 510 (estimate)

12. a) 100      b) 100      c) 100      d) 300      e) 600      f) 1 400

13. a)  $IX = 10 - 1 = 9$       b)  $XVI = 10 + 5 + 1 = 16$   
c)  $XXIX = 10 + 10 + (10 - 1)$       d)  $XXXV = 10 + 10 + 10 + 5 = 35$   
     $= 10 + 10 + 9$   
     $= 29$