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UNIT 1

OPERATIONS WITH DECIMALS AND PERCENT

1.1 Prime and Composite Numbers

- A **prime number** is an integer greater than 1 that has no other positive integer factors other than 1 and itself.
  e.g. 2, 3, 5, and 7 are prime numbers since their only factors are 1 and themselves (e.g. the only factors of 3 are 1 and 3). However, 6 is not prime since it has two different sets of integer factors: 1 and 6 or 2 and 3.

- A **factor** of a number is a divisor of that number (it divides evenly into it).
  e.g. (i) List all factors of 10.
  - 1, 2, 5, and 10 are all factors of 10 since they all divide evenly into it.
  - Of these factors, only 2 and 5 are prime factors.

  (ii) Show the following numbers as products of prime factors.
  - 12 = 2 x 2 x 3
  - 50 = 2 x 5 x 5

- A **multiple** of a number is the product of that number times another whole number greater than 0.
  e.g., Multiples of 5 are (5 x 1) = 5; (5 x 2) = 10; (5 x 3) = 15; (5 x 4) = 20; etc.

- A **composite number** is not a prime number and can be factored in more than one way. All numbers which are not prime are composite (with the exception of 1).
  e.g. 15 is a composite number since it can be factored as 15 x 1 or 5 x 3.

Examples:	**Solution**
1. Which of the following numbers are not prime? **1, 3, 4, 5, 7, 9, 11, 15**	▪ 1 is not prime since it is not greater than 1. ▪ 4, 9, and 15 are not prime. They are composite, since they have more than one pair of factors (e.g. 9 can be factored as 9 x 1 or 3 x 3).
2. List all factors of 20.	▪ Factor 20 as follows: 2 x 2 x 5. ▪ The set of all factors consists of all numbers that divide evenly into 20. ▪ The numbers are: 1 plus all combinations of 2, 2, and 5 shown in step 1. ▪ Answer: 1, 2, 4, 5, 10, 20.

3. List all multiples of 7 less than 40.	▪ Multiples of 7 consist of numbers that are the product of 7 times 1, 2, 3, 4, ..., etc. ▪ We want multiples of 7 less than 40. ▪ 7 x 1, 7 x 2, 7 x 3, 7 x 4, 7 x 5, (7 x 6 is 42, which is larger than 40.) ▪ Answer: 7, 14, 21, 28, 35.
4. Show 90 as a product of prime factors.	▪ Factor 90 until all factors are broken down into prime factors. ▪ 90 = 9 x10 = 3 x 3 x 2 x 5

Exercises 1.1

1. Identify whether or not each number is prime. Then give a reason for it.

Number	Yes/No	Reason
a. 22		
b. 31		
c. 77		
d. 57		
e. 43		
f. 51		

2. List all factors of each number. Then list the prime factors only.

Number	All Factors	Prime Factors Only
a. 30		
b. 100		
c. 75		
d. 90		
e. 135		
f. 38		

3. List all multiples of the following numbers that meet each condition.

Number	Multiples of the Number
a. all multiples of 11 that are greater than 40 and less than 100	
b. all multiples of 5 between 11 and 41	
c. all multiples of 9 less than 100	
d. all multiples of 20 less than 200	
e. all multiples of 13 less than 100 that are odd numbers.	

4. Write each number as a product of prime factors.

Number	Product of Primes
a. 30	
b. 12	
c. 26	
d. 36	
e. 250	

Number	Product of Primes
f. 1000	
g. 90	
h. 216	
i. 196	
j. 242	

Extra for Experts

Question	**Solution**
5. List all factors that are common to both 9 and 30.	
6. List all factors that are common to 10, 14, and 70.	

Solution

7. List all numbers less than 100 that are multiples of both 15 and 10.

8. List all numbers less than 50 that are multiples of both 3 and 5.

9. I am a multiple of both 9 and 15. I am less than 200 and more than 150. Who am I?

10. I am a multiple of 3, 5, and 10. I am less than 100. Who am I?

11. I am a multiple of 3, 5, and 7 and am between 300 and 400. Who am I?

12. I am a number less than 50. If I am a multiple of both 2 and 14, who am I?

1.2 Divisibility of Numbers

Dividing One Number into Another

- We can use certain rules to quickly determine whether or not a first number is divisible by a second number. (Does the second number divide evenly into the first with no remainder?)
  e.g. Is 10 divisible by 2? Yes, 2 divides into 10 five times with no remainder.
  Is 18 divisible by 3? Yes, 3 divides into 18 six times with no remainder.
- An important reason for looking at rules for divisibility is to see if one number is divisible by another without have to do too much calculation. This will be very helpful when we factor large numbers.
- First, let's review the **factor** of a number and then look at some **rules for divisibility**.

Factor of a Number

- When we break a number down to show it as the product of other numbers, those other numbers are called **factors**.
  e.g. **6 = 2 x 3 or 6 = 6 x 1**
  factors of 6 *factors of 6*
- Each of the factors divides evenly into the original number without any remainder (e.g. 2 divides into 6, 3 divides into 6, 1 divides into 6, and 6 divides into 6). We say that 6 is **divisible** by 1, 2, 3, and 6.

Divisibility of a Number

- If a number divides evenly into a second number, we say the second number is **divisible** by the first number. But we also can say that the first number is a **factor** of the second.
  e.g. 5 divides evenly into 10. So 10 is divisible by 5 and 5 is a factor of 10.
- Every whole number is divisible by 1 and itself.
  e.g. 5 is divisible by 1 and 5, 30 is divisible by 1 and 30
- We know that every even whole number is divisible by 2.
  e.g. 4 is divisible by 2, 1, and 4. 22 is divisible by 2, 1, and 22.

Division by Zero

- When we divide one number by another, we could think of dividing it into equal parts. If we divide 10 by 5, we can think of dividing 10 into two equal parts of 5. If we divide 10 by 1, there is one part of 10.
- What if we try to divide by 0? If we divide 10 by 0 how many parts of 0 are there? Or how many zeros would give us 10? This is not meaningful, so we say division by 0 is undefined. If you check this with a calculator it will give you an error message. Many calculators will show this as a symbol looking like ***- E -***.

Divisibility Rules for 2, 3, 4, 5, 6, 8, 9, and 10

- The following rules let you test if one number can be evenly divided by another, without having to do too much calculation.

A number is divisible by:	If the following is true:	Example:
2	The last digit is even (e.g. 0,2,4,6,8)	34**2** is divisible by 2. 54**3** is not divisible by 2.
3	The sum of the digits is divisible by 3	**426** (4 + 2 + 6 = 12) and (12 ÷ 3 = 4). **Yes** it is divisible by 3. **322** (3 + 2 + 2 = 7) and (7 ÷ 3 = $2^1/_3$). **No** it is not divisible by 3.
4	The last 2 digits are divisible by 4	21**08** (08 = 8) and (8 ÷ 4 = 2). **Yes** 2108 is divisible by 4. 26**27** (27 ÷ 4 = 2.25). **No** it is not.
5	The last digit is 0 or 5	17**5** is divisible by 5. (It ends in a 5.) 80**9** is not divisible by 5.(It doesn't end in either a 5 or a 0.)
6	The number is divisible by both 2 *and* 3	252 (It is even so it is divisible by 2, and 2 + 5 + 2 = 9, and 9 ÷ 3 = 3.) **Yes** 136 (It is even so it is divisible by 2, but 1 + 3 + 6 = 10, which is not divisible by 3.) **No**
8	The last three digits are divisible by 8	5**928** (928 ÷ 8 = 116) **Yes** 6**660** (660 ÷ 8 = 82.5) **No**
9	The sum of all the digits are divisible by 9	**4932** (4 + 9 + 3 + 2 = 18 and 18 ÷ 9 = 2) **Yes** **4192** (4 + 1 + 9 + 2 = 16 and 16 ÷ 9 = $1\frac{7}{9}$) **No**
10	The number ends in 0	456**0** **Yes** it ends in zero. 431**2** **No** it doesn't end in zero.

Examples with Solutions

1. Which of the following numbers are divisible by 5? **8, 15, 30, 48, 65**	▪ *According to the rule, a number must end in either a 5 or else a 0 to be divisible by 5.* ▪ *The numbers are 15, 30 and 65.*
2. Which of the following numbers are divisible by 3? **53, 159, 305, 2061**	▪ *According to the rule, a number is divisible by 3 if the sum of the digits in the number is divisible by 3.* ▪ *The numbers are 159 and 2061.*
3. Which of the following numbers are divisible by 6? **2243, 4542, 3152, 3144**	▪ *According to the rule, a number is divisible by 6 if it is divisible by both 2 and 3 (it is even and the sum of digits is divisible by 3).* ▪ *4542, 3152 and 3144 are even so they are divisible by 2.* ▪ *Only 4542 and 3144 are also divisible by 3 since the sum of their digits is divisible by 3.* ▪ *The numbers are 4542 and 3144.*
4. Which of the following numbers are divisible by 8? **413, 2336, 4033, 56728**	▪ *According to the rule, a number is divisible by 8 if the number formed by the last 3 digits is divisible by 8.* ▪ *The numbers are 2336 and 56728.*
5. If the following number is divisible by 9, what number must the last digit be equal to? **456?**	▪ *According to the rule, a number is divisible by 9 if the sum of the digits in the number is divisible by 9.* ▪ *The number must be 3 since (4 + 5 + 6 + 3 = 18, which is divisible by 9).*
6. If the following number is divisible by 8, what digits could the last digit be equal to? **340?**	▪ *According to the rule, a number is divisible by 8 if the number formed by the last 3 digits is divisible by 8.* ▪ *The digits could be 0 or 8 (giving 3400 and 3408 since 400 and 408 are both divisible by 8.*

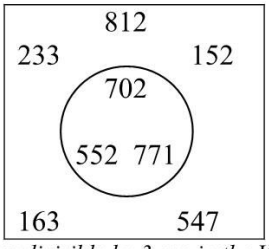
Representing Divisors in Different Ways

- We could organize divisors of a number (or what a number is divisible by) using different types of graphs, such as **Venn diagrams** and **Carroll diagrams.**

Venn Diagram

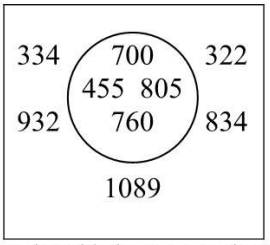
- A **Venn diagram** is a picture of numbers that belong and numbers that do not belong to a set with certain properties. It helps to clarify what numbers do belong and what numbers do not. We usually show all of the numbers that we could be interested in inside of a rectangle (called the universe), and then we draw a circle around those that have the certain properties we are after.
- Two examples of Venn diagrams relative to divisibility are shown next.

e.g. 1. The following numbers that are divisible by 3:
233, 152, 163, 702, 552, 812, 771, 547



Numbers divisible by 3 are in the Venn diagram and those that aren't are in the rectangle (universe) but not in the circle (the sums of their digits are divisible by 3)

e.g. 2. The following numbers that are divisible by 5.
334, 700, 455, 322, 932, 805, 760 1089, 834



Numbers divisible by 5 are in the Venn diagram and those that aren't are in the rectangle (universe) but not in the circle (each number ends in a 5 or a 0)

Carroll Diagram

- A **Carroll diagram** displays "yes/no" information (categorical data) in a table form.
- Two examples involving divisibility are shown next.
  e.g. Find the following numbers that are divisible by 6.
  345, 1062, 432, 1209, 531, 644
  Recall that to be divisible by 6 a number must be even (divisible by 2) and the sum of its digits must be divisible by 3.

	Yes	**No**
Even	**1062**,**432**,644	345,1209,531
Sum of Digits divisible by 3	**1062**, **432**, 345,531,1209	644
Both Even and Divisible by 3	1062, 432	

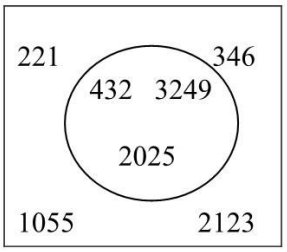
- Numbers that are <u>both</u> even and divisible by 3 are 1062 and 432.

Examples with Solutions

1. Use a Venn diagram to show each of the following numbers.

   a. Numbers that are divisible by 9 from the following numbers.

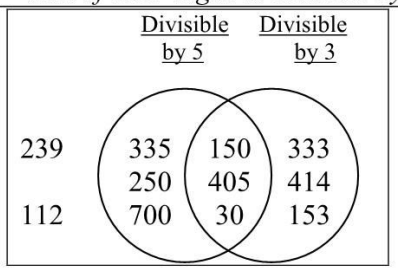
   432, 221, 3249, 346
   1055, 2025, 2123



Note: numbers are divisible by 9 if the sum of their digits is divisible by 9.

   b. Numbers that are divisible by <u>both</u> 5 and 3 from the following numbers.

   30, 150, 153, 250, 333, 335, 405, 414, 700, 239, 112



Note: Numbers divisible by 5 end in a 5 or a 0 and numbers are divisible by 3 if the sum of their digits is divisible by 3.

- *The following numbers are divisible by <u>both</u> 5 and 3: 150, 405, 30.*
- *Note that these numbers are located where the diagrams overlap or intersect.*

2. Fill in the blanks in the Carroll diagram and determine which numbers are divisible by <u>both</u> 5 and 9.

35, 70, 135, 216, 225, 430, 621, 4338

Recall that

- *If a number is divisible by 5, it ends in a 5 or a 0.*
- *If a number is divisible by 9, the sum of the digits is divisible by 9.*

	Yes	**No**
Divisible by 5	35, 70, 135, 225, 430	216, 4338, 621
Divisible by 9	135,216, 225, 4338,621	35, 70, 430
Divisible by both 5 and 9	135, 225	

- Numbers that are divisible by both 5 and 9 are 135 and 225.

Exercises 1.2

Answer questions #1 to #5 by using the rules for divisibility. Do not perform the actual division.

1. Which of the following numbers are divisible by 2?

   23, 44, 105, 112, 1012, 3700

2. Which of the following numbers are divisible by 5?

   51, 15, 35, 60, 205, 222, 1080

3. Which of the following numbers are divisible by 4?

   22, 44, 320, 105, 210, 244

4. Which of the following numbers is divisible by 3?

   33, 65, 72, 135, 220, 451, 513

5. Which of the following numbers is divisible by 10?

   25, 50, 750, 555, 2130

***True or false? (*questions #6 to #10)**

6. All numbers divisible by 9 are also divisible by 3. *True* __ *False* __

7. All numbers divisible by 3 are also divisible by 9. *True* __ *False* __

8. All numbers divisible by 10 are also divisible by 5. *True* __ *False* __

9. All numbers divisible by 4 are also divisible by 2. *True* __ *False* __

10. All numbers divisible by 2 are also divisible by 4. *True __ False __*

11. List all numbers between 230 and 241 that are divisible by 3.

12. List all numbers between 112 and 151 that are divisible by 5.

13. Find all numbers between 100 and 115 that are divisible by 6.

14. Fill in the blanks in the Carroll diagram on the right and determine which of the following numbers are divisible by <u>both</u> 3 and 4.

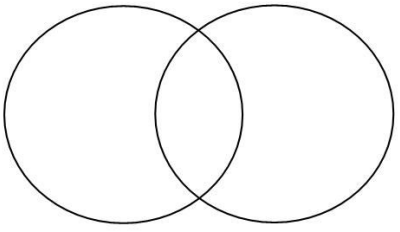
129, 612, 642, 705, 712, 828, 908, 1016

	Yes	**No**
Divisible by 3		
Divisible by 4		
Divisible by both 3 and 4		

15. Fill in the Venn diagram below to show which numbers are divisible by both 5 and 2.

4, 12, 15, 30, 45, 60, 75, 100, 105, 110, 150, 156

<u>Divisible by 2</u> <u>Divisible by 5</u>



Extra for Experts

16. Find all numbers less than 50 that are divisible by 2, 3 and 4.

17. Find all numbers less than 150 that are divisible by both 5 and 6.

Find all possible values for the missing digit in the questions that follow.

18. What value(s) for the missing digit would make the number below divisible by 5?

    321?

19. What value(s) for the missing digit would make the number below divisible by 6?

    425?

20. What value(s) for the missing digit would make the number below divisible by 3?

    421?

21. What value(s) for the missing digit would make the number below divisible by 8?

    2013?

22. What value(s) for the missing digit would make the number below divisible by 5? (note: the same missing digit is repeated twice)

    1?2?

1.3 Addition and Subtraction of Decimals

Adding and Subtracting Decimals

- We add and subtract decimals in many different day-to-day situations. For example, when we use money, we are involving decimals. For example, if you bought a package of gum for 45¢ (or \$0.45) and a tin of pop for 35¢ (or \$0.35), altogether it would cost 45¢ + 35¢ = 80¢ (or \$0.45 + \$0.35 = \$0.80). Another example could be purchasing two packages of hamburger, one with a mass of 1.2 kg and the other with a mass of 1.3 kg. Altogether there would be 1.2 + 1.3 = 2.5 kg of hamburger.

- We will look at the following three approaches for the addition and subtraction of decimals:

  - Front end estimation to **estimate** the sum
  - Using both number and word statements to find the **exact** sum
  - Using a process to find the **exact** sum

Using Front End Estimation

- If we want to **estimate** the sum or difference of decimals we could look at the sum of the whole number parts only.
  e.g. 1. 6.4 + 45.1 + 135.2, *think* 6 + 45 + 135 = 186 (adding whole number parts only). The sum is greater than 186.
  2. 84 – 9.4, *think* 84 - 9 = 75. The difference is less than 75 (we are subtracting a number greater than 9).
  3. 53.4 – 30, *think* 53 – 30 = 23. The difference is greater than 23 (we are beginning with a number greater than 53).

Using Word and Number Statements

- We can find sums and differences for some decimals quite easily by using number and word statements.
  e.g. 1. Find the sum of 0.2 and 0.6. ***Think****: two tenths plus six tenths equals eight tenths (or 0.2 + 0.6 = 0.8)*
  2. Find the difference between 0.58 and 0.26. ***Think****: 58 hundredths minus 26 hundredths equals thirty two hundredths (or 0.58 – 0.26 = 0.32)*

Examples with Solutions

1. Use front end estimation to *estimate* a number that the *exact* sum is greater than.	
a. 105.4 + 16.3 + 20.1	*105 + 16 + 20 = 141 (use whole numbers)* *The exact sum is greater than 141.*
b. 4326.4 + 200.3	*4326 + 200 = 4526 (use whole numbers)* *The exact sum is greater than 4526.*
c. 70.31 + 34.2 + 45.03	*70 + 34 + 45= 149 (use whole numbers)* *The exact sum is greater than 149.*
2. Use front end estimation to find a number that the difference is either greater than or less than the *exact* difference.	
a. 233 – 40.24	*233 – 40 = 193 (use whole numbers)* *The exact difference is less than 193.*
b. 155.23 – 21	*155 – 21 = 134 (use whole numbers)* *The exact difference is greater than 134.*
3. Use word and number statements to find each sum or difference.	
a. 0.2 + 0.7	*two tenths plus seven tenths equal nine tenths or 0.2 + 0.7 = 0.9*
b. 0.09 + 0.24	*nine hundredths plus twenty four hundredths equal thirty three hundredths or 0.09 + 0.24 = 0.33*
c. 25.05 + 12.22	*twenty five and five hundredths plus twelve and twenty two hundredths equal thirty seven and twenty seven hundredths or 25.05 + 12.22 = 37.27*
d. 121.22 + 5.23	*one hundred twenty one and twenty two hundredths plus five and twenty three hundredths equal one hundred twenty six and forty five hundredths or 121.22 + 5.23 = 126.45*

Using a Process to find Exact Values when Adding or Subtracting Decimals

- Rules
  1. Line up the decimal points vertically.
  2. Find the sum or difference of digits in the same column, beginning at the right.
  3. For addition - If the sum of digits in the same column is 10 or more, carry the tens digit to the left.
  4. For subtraction - If the difference of digits in the same column is not sufficient, borrow from left to right.

```
   1
e.g. 42.64   ← 7 + 4 = 11 ∴  carry 1 left and keep 1
   + 5.27
     47.91

    71
     3.82    ← 2 is not large enough to take away 5, borrow 1
   - 1.65
     2.17
```

Examples with Solutions

1. Find the sum of the following numbers. 4012.3 + 20.82	*1. Arrange vertically and line up the decimal points.* 4012.3 + 20.82 *2. Sum digits in the same column and carry where needed.* 4012.3 + 20.82 4033.12
2. Find the difference between the following numbers. 435.24 – 43.15	*1. Arrange vertically and line up the decimal points.* 435.24 - 43.15 *2. Find the difference of digits in the same column and borrow where needed.* 435.24 - 43.15 392.09

Exercises 1.3

1. Use front end estimation to find an **estimate** for each sum.

   a. 27.23 + 130.2 + 5.14

   b. 333.33 + 22.022 + 21.1

   c. 2.02 + 3.12 + 222.061

   d. 4002.02 + 21.25 + 30.011

2. Use front end estimation to find an **estimate** for each difference and state whether the estimate is greater than or less than the exact difference.

   a. 45.3 – 22 =

   b. 132 – 45.7 =

   c. 3004.35 – 20.1 =

   d. 56.12 – 29.5 =

3. Use any process to find each sum.

   a. 23.8
   +7.5

   b. 170.6
   + 62.7

   c. 2450.37
   + 652.45

   d. 2360.43
   + 468.62

   e. 21.5
   + 103.2

   f. 252.08
   + 7.25

   g. 3.5 + 2.7 + 8.6

   h. 35.05 + 234.28

   i. 23.28 + 17.75

   j. 3405.06
   5428.87
   + 208.22

   k. 23.66
   403.45
   + 25.9

   l. 22.563
   45.22
   + 4.088

4. Use any process to find each difference.

a. 45.4
- 26.3

b. 152.26
- 23.25

c. 2550.06
- 465.14

d. 3565.233
- 340.22

e. 1200.4
- 56.3

f. 1550.055
- 452.111

g. 43.6 – 2.45

h. 450.03 – 22.6

i. 43.44 – 9.08

j. 15.35 – 12.44

k. 100.9 – 5.66

l. 3250.52 – 465.6

Solve each of the following problems.

Solution

5. The cost of a one-way ticket to Prince George is $287.75 and the cost of a return trip is $509.00. How much cheaper is it to buy a return trip ticket than to purchase two one-way tickets?

Solution

6. A rope measuring 8.6 m was cut into two pieces. If the first piece was 3.8 m long, how long was the second piece?

7. Selina had $100 to spend for entertainment. If she purchased a ticket for a hockey game for $59.75, how much did she have left?

8. Cindy bought a blouse for $23.50, a pair of jeans for $29.95, and a hat for $17.50. How much did all of these purchases cost?

9. Roger decided to go on a Sunday drive. When he started out, the odometer on his car was at 76 652.4 km and when he returned it was at 77 054.3 km. How far did he drive?

10. Jim, Ralph and Rory weighed themselves prior to a basketball game. Jim weighed 75.3 kg, Ralph weighed 70.43 kg and Rory weighed 76.58 kg. How many kilograms in total did they weigh?

11. Marina and Brenda saved a total of $235.85. If Marina saved $122.03 how much did Brenda save?

Extra for Experts ***Solution***

12. The total length of 3 boards was 21.35 m. If one board was 8.2 m long and another was 6.42 m long, how long was the third board?

13. David needed three boards to complete a bookshelf. One board was 2.8 m long and another was 3.6 m long. If the total length of all the boards was 10.5 m, how long was the third board?

14. Lorna purchased a pair of shoes for $39.65 and a sweater for $41.99. How much change would she receive from a $100 bill?

15. Find each missing number.

    a. $\begin{array}{r} 350.\mathbf{?}5 \\ +\ 37.29 \\ \hline 388.04 \end{array}$

    b. $\begin{array}{r} 1150.09 \\ -\ 8\mathbf{?}.61 \\ \hline 1066.48 \end{array}$

16. The sum of two numbers is 145.6 and the difference between the numbers is 15.2. What are the numbers?

APPENDIX

MATHEMATICS GRADE 7

ANSWERS TO EXERCISES AND UNIT TESTS

UNIT 1 – ANSWERS

Page 3: Exercises 1.1

1. a. No Factors are 1 x 22 and 2 x 11.
   b Yes Only factors are 1 and 31.
   c. No Factors are 1 x 77 and 7 x 11.
   d. No Factors are 1 x 57 and 3 x 19.
   e. Yes Only factors are 1 and 43.
   f. No Factors are 1 x 51 and 3 x 17.

2.	All factors	Prime factors
a.	1, 2, 3, 5, 6, 10, 15, 30	2, 3, 5
b.	1, 2, 4, 5, 10, 20, 25, 50, 100	2, 5
c.	1, 3, 5, 15, 25, 75	3, 5
d.	1, 2, 3, 5, 6, 9, 10, 15, 30, 18, 45, 90	2, 3, 5
e.	1,3,5,9,15,27,45,135	3,5
f.	1,2,19,38	2,19

3.	Multiples of the number	Multiples of the number
a.	44, 55, 66, 77, 88, 99	d. 20, 40, 60, 80, 100, 120, 140, 160, 180
b.	15, 20, 25, 30, 35, 40	e. 13,39,65,91
c.	9, 18, 27, 36, 45, 54, 63, 72, 81, 90, 99	

4.a 2 x 3 x 5 e. 2 x 5 x 5 x 5 i. 2 x 2 x 7 x 7
b. 2 x 2 x 3 f. 2 x 2 x 2 x 5 x 5 x 5 j. 2 x 11 x 11
c. 2 x 13 g. 3 x 3 x 2 x 5
d. 2 x 2 x 3 x 3 h. 2 x 2 x 2 x 3 x 3 x 3

Extra for Experts

5. 1, 3 7. 30, 60, 90 9. 180 11. 315
6. 1, 2 8. 15, 30, 45 10. 30, 60, 90 12. 14, 28, 42

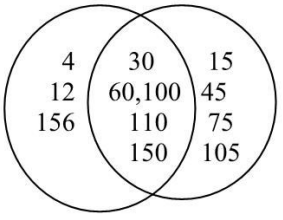
Page 11: Exercises 1.2

1. 44, 112, 1012, 3700 2. 15, 35, 60, 205, 1080 3. 44, 320, 244 4. 33, 72, 135, 513
5. 50, 750, 2130 6. True 7. False 8. True 9. True 10. False
11. 231, 234, 237, 240 12. 115, 120, 125, 130, 135, 140, 145, 150 13. 102, 108, 114

14.

	Yes	No
Divisible by 3	129,612, 642, 705, 828	712, 908, 1016
Divisible by 4	612, 712, 828, 908, 1016	129, 642, 705
Divisible by both 3 and 4	612, 828	

15.



16. 12, 24, 36, 48
17. 30, 60, 90, 120
18. 5 or 0
19. 4
20. 2, 5, 8
21. 6
22. 0, 5

Page 17: Exercises 1.3

1a) 162	b) 376	c) 227	d) 4053	2a) 23, greater than
b) 87, less than	c) 2984, greater than	d) 27, less than	3a) 31.3	b) 233.3
3c) 3102.82	d) 2829.05	e) 124.7	f) 259.33	g) 14.8
3h) 269.33	i) 41.03	j) 9042.15	k) 453.01	l) 71.871
4a) 19.1	b) 129.01	c) 2084.92	d) 3225.013	e) 1144.1
4f) 1097.944	g) 41.15	h) 427.43	i) 34.36	j) 2.91
4k) 95.24	l) 2784.92	5. $66.50	6. 4.8 m	7. $40.25
8. $70.95	9. 401.9 km	10. 222.31 kg	11. $113.82	12. 6.73 m