Grade 6 – Answers
(CAPS Edition)

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Chapter A1

Number systems

A1.1 Natural numbers, whole numbers, even numbers and uneven numbers:

NATURAL NUMBERS	WHOLE NUMBERS
1 ; 2 ; 3 ; 4 ; 5 ; 6 ; 7 ; 8 ; ___	0 ; 1 ; 2 ; 3 ; 4 ; 5 ; 6 ; 7 ; 8 ; 9 ; ___

Even numbers: 2 ; 4 ; 6 ; 8 ; 10 ; . . .
Divisible by 2 without a remainder.

Uneven numbers: 1 ; 3 ; 5; 7 ; 9 ; 11 ; . . .
If you **divide** by 2, there will be a remainder.

Exercise 1: **Date:** _____

(1) Complete the number patterns:

(a) Whole numbers smaller than 10: 9; 8; 7; 6; 5; 4; 3; 2; 1; 0

(b) Natural numbers between 21 and 28: 22; 23; 24; 25; 26; 27

(c) Even numbers between 52 and 64: 54; 56; 58; 60; 62

(d) Uneven numbers from 35 to 45: 35; 37; 39; 41; 43; 45

(e) Even numbers smaller than 146 but greater than 140: 144; 142

(f) The natural numbers smaller than 21 but greater than 15: 20; 19; 18; 17; 16

(g) The first 5 natural numbers which will be uneven: 1; 3; 5; 7; 9

(h) The first 5 whole numbers which are natural numbers as well: 1; 2; 3; 4; 5

(i) The even numbers from 132 to 142: 132; 134; 136; 138; 140; 142

(j) The whole numbers between 164 and 172 which are also divisible by 2: 166; 168; 170

(k) Write the three even numbers preceding 60 006: 60 004; 60 002; 60 000

(l) Write the first three uneven numbers following 5 999: 6001; 6003; 6005.

(2) Complete the next 5 numbers in the following sequences:

(a) 2 (+2); 4 ; 6 ; 8 ; 10 ; 12; 14; 16; 18; 20

(b) 110 (+10); 120 ; 130 ; 140 ; 150; 160; 170; 180; 190

(c) 11 (+10); 21 ; 31 ; 41 ; 51 ; 61; 71; 81; 91; 101

(d) 18 (+9); 27 ; 36 ; 45; 54; 63; 72; 81

ADDITION (Speed test)

Exercise A1A: Date: _____

Only write down the answer:

3 + 7 = 10	2 + 5 = 7	6 + 1 = 7	4 + 5 = 9
3 + 2 = 5	2 + 4 = 6	6 + 3 = 9	4 + 4 = 8
3 + 5 = 8	2 + 5 = 7	6 + 6 = 12	4 + 9 = 13
3 + 1 = 4	2 + 3 = 5	6 + 8 = 14	4 + 7 = 11
3 + 6 = 9	2 + 9 = 11	6 + 7 = 13	4 + 8 = 12
3 + 8 = 11	2 + 1 = 3	6 + 9 = 15	4 + 12 = 16
3 + 4 = 7	2 + 0 = 2	6 + 4 = 10	4 + 6 = 10
3 + 9 = 12	2 + 6 = 8	6 + 2 = 8	4 + 3 = 7
3 + 0 = 3	2 + 8 = 10	6 + 5 = 11	4 + 0 = 4
3 + 1 = 4	2 + 7 = 9	6 + 12 = 18	4 + 13 = 17
3 + 3 = 6	2 + 2 = 4	6 + 0 = 6	4 + 16 = 20
Total: ☐	Total: ☐	Total: ☐	Total: ☐

Total out of 40: ☐

(e) 1 ; 2 ; 3 ; 4 ; 5; 6; 7; 8; 9

(f) 19 200 ; 9 600 ; 4 800; 2400; 1200; 600; 300; 150 (−2)

(g) 3 ; 9 ; 15 ; 21; 27; 33; 39; 45 (+6)

(h) 72 ; 63 ; 54 ; 45 ; 36; 27; 18; 9; 0 (−9)

(i) 1 ; 4 ; 9 ; 16; 25; 36; 49; 64; 81 (1×1, 2×2)

(j) 100 ; 99 ; 97 ; 94 ; 90 ; 85; 79; 72; 64; 55 (−1)

(k) *a* ; *i* ; *b* ; *i* ; *c* ; *i*; *d*; *i*; *e*; *i*

(l) 906 ; 900 ; 894 ; 888; 882; 876; 870; 864 (−6)

(m) 36 ; 32 ; 38 ; 34; 40; 36; 42; 38 (−4, +6)

(n) 51 ; 43 ; 36 ; 30 ; 25; 21; 18; 16; 15 (−8, −7, −6)

(3) Complete:

(a) The four even numbers preceding 10 000: 9998; 9996; 9994; 9992

(b) The four even numbers following 7 984: 7986; 7988; 7990; 7992

(c) The largest six-digit number: 999 999

(d) The smallest four-digit number: 1000

A.1.2 RULES OF DIVISIBILITY:

Divisible by '2' All numbers ending on an even number are divisible by '2' **EXAMPLE: '3 458'** The number ends on an '8' and is therefore divisible by '2'.	**Divisible by '5'** All numbers ending on a '0' or a '5' are divisible by '5'. **EXAMPLE: '9 785'** The number ends on a '5' and is therefore divisible by '5'.	**Divisible by '10'** All numbers ending on a '0' are divisible by '10'. **EXAMPLE: '2 040'** The number ends on a '0' and is therefore divisible by '10'.
Divisible by '3' If the sum of all the digits of the number is divisible by '3' then the number will be divisible by '3'. **EXAMPLE: '351'** The sum of the digits in the number '351' is 3 + 5 + 1 = 9, which is divisible by 3, the entire number i.e. the entire number is divisible by '3'.	**Divisible by '4'** If the last two digits of a number are divisible by '4' then the entire number will be divisible by '4'. **EXAMPLE: '336'** The '36' in the number '336' is divisible by '4' and the entire number will therefore be divisible by '4'.	**Divisible by '6'** If a number is divisible by '2' and '3' then the number will be divisible by '6'. **EXAMPLE: '258'** The number '258' is divisible by '2' and '3' and is therefore divisible by '6'.

Exercise 2: **Date:** _____

(1) Make a ✓ in the correct block(s).

NUMBER	DIVISIBLE BY '2'	DIVISIBLE BY '3'	DIVISIBLE BY '4'	DIVISIBLE BY '5'	DIVISIBLE BY '6'	DIVISIBLE BY '10'
64	✓		✓			
373						
260	✓		✓	✓		✓
875				✓		
9 000	✓	✓	✓	✓	✓	✓
22 677		✓				
30 000	✓	✓	✓	✓	✓	✓
5 899						
12 972	✓	✓	✓		✓	
54 788	✓		✓			

(2) Give a reason why each of the following numbers is divisible by the number in brackets.

(a) 3 465 (divisible by 5): Ends on 5 or 0

(b) 6 890 (divisible by 10): Ends on 0

(c) 6 348 (divisible by 2): Ends on an even number

(d) 23 648 (divisible by 4): last two numbers are divisible by 4

(e) 156 (divisible by 6): The number is divisible by 2 and 3

(3) Give all possible numbers suitable for the ☐ in order for the number to be divisible by '2'.

56 78 x $x =$ [0] $x =$ [2] $x =$ [4] $x =$ [6] $x =$ [8]

(4) Give all possible numbers suitable for the ☐ in order for the number to be divisible by '3'.

13 48 x $x =$ [2] $x =$ [5] $x =$ [8]

(5) Give all possible numbers suitable for the ☐ in order for the number to be divisible by '4'.

67 76 x $x =$ [0] $x =$ [4] $x =$ [8]

ADDITION (Speed test)

Exercise A1B: **Date:** _____

Only write down the answer:

5 + 7 = 12	7 + 5 = 12	9 + 1 = 10	12 + 5 = 17
5 + 2 = 7	7 + 4 = 11	9 + 3 = 12	12 + 4 = 16
5 + 5 = 10	7 + 5 = 12	9 + 6 = 15	12 + 9 = 21
5 + 1 = 6	7 + 3 = 10	9 + 8 = 17	12 + 7 = 19
5 + 6 = 11	7 + 9 = 16	9 + 7 = 16	12 + 8 = 20
5 + 8 = 13	7 + 1 = 8	9 + 9 = 18	12 + 12 = 24
5 + 4 = 9	7 + 0 = 7	9 + 4 = 13	12 + 6 = 18
5 + 9 = 14	7 + 6 = 13	9 + 2 = 11	12 + 3 = 15
5 + 0 = 5	7 + 8 = 15	9 + 5 = 14	12 + 0 = 12
5 + 1 = 6	7 + 7 = 14	9 + 12 = 21	12 + 13 = 25
5 + 3 = 8	7 + 2 = 9	9 + 0 = 9	12 + 16 = 27
Total: ☐	Total: ☐	Total: ☐	Total: ☐

Total out of 40:

A1.3 Factors:

Factors: These are numbers that can divide into another number without a remainder.

Example: 12

1 x 12
2 x 6
3 x 4

F_{12}: {1; 2; 3; 4; 6; 12}

Exercise 3: **Date:** _____

(1) Calculate the factors of the following numbers by using your timetables.

(a) 20

1 X 20
2 X 10
4 X 5

F_{20}: 1; 2; 4; 5; 10; 20

(b) 24

1 X 24
2 X 12
3 X 8
4 X 6

F_{24}: 1; 2; 3; 4; 6; 8; 12; 24

(c) 36

1 X 36
2 X 18
3 X 12
4 X 9
6 X 6

F_{36}: 1; 2; 3; 4; 6; 9; 12; 18; 36

(d) 56

1 X 56
2 X 28
4 X 14
7 X 8

F_{56}: 1; 2; 4; 7; 8; 14; 28; 56

(e) 72

1 X 72
2 X 36
3 X 24
4 X 18
6 X 12
8 X 9

F_{72}: 1; 2; 3; 4; 6; 8; 9; 12; 18; 24; 36; 72

(f) 100

1 X 100
2 X 50
4 X 25
5 X 20
10 X 10

F_{100}: 1; 2; 4; 5; 10; 20; 25; 50; 100

(g) 70

1 X 70
2 X 35
5 X 14
7 X 10

F_{70} = 1; 2; 5; 7; 10; 14; 35; 70

(h) 90

1 X 90
2 X 45
3 X 30
5 X 18
6 X 15
9 X 10

F_{90} = 1; 2; 3; 5; 6; 9; 10; 15; 18; 30; 45; 90

(i) 42

1 X 42
2 X 21
3 X 14
6 X 7

F_{42} = 1; 2; 3; 6; 7; 14; 21; 42

(2) Write the factors of the following numbers:

(a) F_{21}: 1; 3; 7; 21

(b) F_{30}: 1; 2; 3; 5; 6; 10; 15; 30

(c) F_{60}: 1; 2; 3; 4; 5; 6; 10; 12; 15; 20; 30; 60

(d) F_{72}: 1; 2; 3; 6; 8; 9; 12; 24; 36; 72

(e) F_{75}: 1; 3; 5; 15; 25; 75

(f) F_{80}: 1; 2; 4; 5; 8; 10; 16; 20; 40; 80

*(g) F_{200}: 1; 2; 4; 5; 8; 10; 20; 25; 40; 50; 100; 200

*(h) F_{1000}: 1; 2; 4; 5; 8; 10; 20; 25; 40; 50; 100; 125; 200; 250; 500; 1000

SUBTRACTION (Speed test)

Exercise A1C: **Date:** _____

Only write down the answer:

9 - 7 = 2	13 - 5 = 8	19 - 1 = 18	15 - 5 = 10
9 - 2 = 7	13 – 4 = 9	19 - 3 = 16	15 - 4 = 11
9 - 5 = 4	13 - 5 = 8	19 - 6 = 13	15 - 9 = 6
9 - 1 = 8	13 – 3 = 10	19 - 8 = 11	15 - 7 = 8
9 - 6 = 3	13 - 9 = 4	19 - 7 = 12	15 - 8 = 7
9 - 8 = 1	13 - 1 = 12	19 - 9 = 10	15 - 12 = 3
9 - 4 = 5	13 - 0 = 13	19 - 4 = 15	15 - 6 = 9
9 - 9 = 0	13 - 6 = 7	19 - 2 = 17	15 - 3 = 12
9 - 0 = 9	13 - 8 = 5	19 - 5 = 14	15 - 0 = 15
9 - 3 = 6	13 – 7 = 6	19 - 12 = 7	15 -13 = 2
19 - 11 = 8	13 - 2 = 11	19 - 0 = 19	15 - 9 = 6
Total:	Total:	Total:	Total:

Total out of 40:

(3) Write the missing factors:

(a) F_{18}:

1	2	3	6	9	18

(b) F_{42}:

1	2	3	6	7	14	21	42

(c) F_{50}:

1	2	5	10	25	50

(d) F_{64}:

1	2	4	8	16	32	64

(e) F_{100}:

1	2	4	5	10	20	25	50	100

(4) Consider the following:

MORE COMPLICATED FACTORS: **Use the rules of divisibility to help you!**

Find the factors of:

132	150
1 x 132	1 x 150
2 x 66	2 x 75
3 x 44	3 x 50
4 x 33	5 x 30
6 x 22	6 x 25
11 x 12	10 x 15

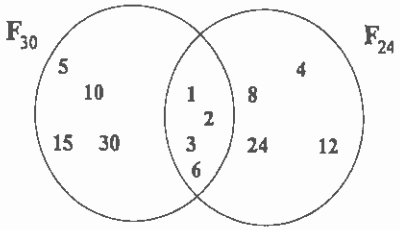
F_{132} = 1; 2; 3; 4; 6; 11; 12; 22; 33; 44; 66; 132

F_{150} = 1; 2; 3; 5; 6; 10; 15; 25; 30; 50; 150; 150

A1.4 Common factors:

F_{30}: 1 ; 2 ; 3 ; 5 ; 6 ; 10 ; 15 ; 30

F_{24}: 1 ; 2 ; 3 ; 4 ; 6 ; 8 ; 12 ; 24



Common factors (CF):

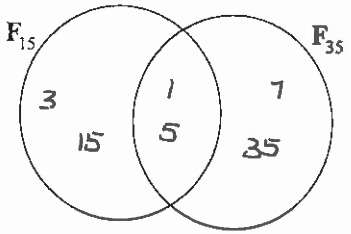
CF: 1 ; 2 ; 3 ; 6

Exercise 4: Date: _____

(1) Write the factors and complete the circle diagram.

(a) F_{15}: 1; 3; 5; 15

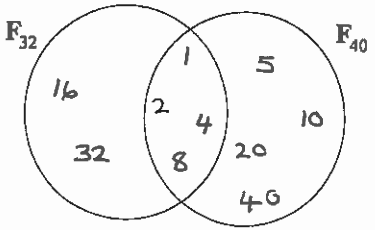
F_{35}: 1; 5; 7; 35



CF: 1; 5

(b) F_{32}: 1; 2; 4; 8; 16; 32

F_{40}: 1; 2; 4; 5; 8; 10; 20; 40



CF: 1; 2; 4; 8

SUBTRACTION (Speed test)

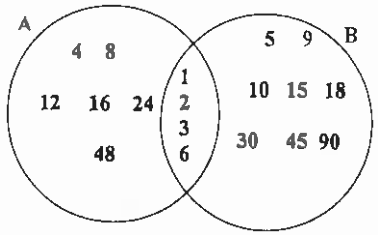
Exercise A1D: Date: _____

Only write down the answer:

29 - 19 = 10	33 - 5 = 28	39 - 19 = 20	45 - 25 = 20
29 - 10 = 19	33 - 4 = 29	39 - 13 = 26	45 - 14 = 31
29 - 5 = 24	33 - 5 = 28	39 - 6 = 33	45 - 40 = 5
29 - 11 = 18	33 - 3 = 30	39 - 8 = 31	45 - 20 = 25
29 - 6 = 23	33 - 9 = 24	39 - 8 = 31	45 - 8 = 37
29 - 8 = 21	33 - 1 = 32	39 - 9 = 30	45 - 2 = 43
29 - 4 = 25	33 - 0 = 33	39 - 4 = 35	45 - 6 = 39
29 - 9 = 20	33 - 6 = 27	39 - 0 = 39	45 - 3 = 42
29 - 0 = 29	33 - 8 = 25	39 - 5 = 34	45 - 0 = 45
29 - 3 = 26	33 - 7 = 26	39 - 29 = 10	45 - 15 = 30
29 - 29 = 0	33 - 2 = 31	39 - 0 = 39	45 - 9 = 36
Total:	Total:	Total:	Total:

Total out of 40:

(2) Study the set of factors below and answer the following questions:



(a) The factors of which number is represented by A? 48

(b) The factors of which number is represented by B? 90

(c) What is the common factors of A and B? 1; 2; 3; 6

(d) What is the highest common factor (HCF) of A and B? 6

(e) Which of the common factors are also even numbers? 2; 6

(3) Complete:

F_{36}: 1; 2; 3; 4; 6; 9; 12; 18; 36

F_{60}: 1; 2; 3; 4; 5; 6; 10; 12; 15; 20; 30; 60

Common factors: 1; 2; 3; 4; 6; 12

HCF: 12

(4) Complete:

F_{56}: 1; 2; 4; 7; 8; 14; 28; 56

F_{49}: 1; 7; 49

Common factors: 1; 7

HCF: 7

(5) Write the HCF of the following numbers:

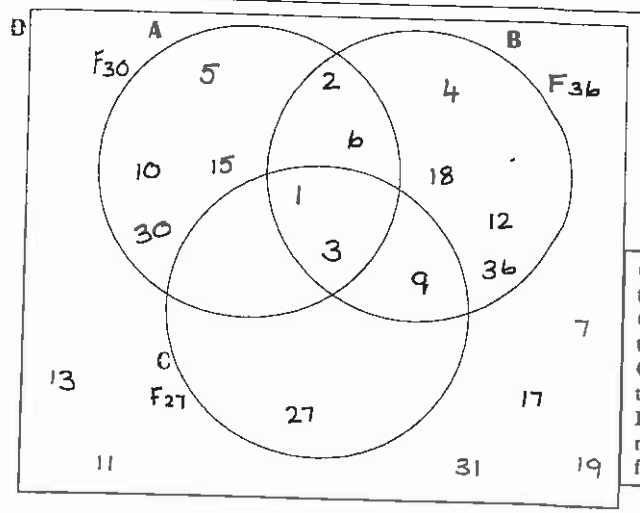
(a) 56 and 64 — 8 (b) 36 and 48 — 12

(c) 144 and 60 — 12 (d) 45 and 90 — 9

(5) **A challenge!**

Complete the table by writing the numbers in the correct space and answer the questions

1 ; 2 ; 3 ; 4 ; 5 ; 6 , 7 ; 9 ; 10 ; 11 ; 12 ; 13 ; 15 ; 17 ; 18 ; 19 ; 27 ; 30 ; 31 ; 36



Circle A represents the factors of 30
Circle B represents the factors of 36
Circle C represents the factors of 27
Block D is all the numbers not suitable for one of the circles.

(a) Which of the numbers are common factors of 30 (circle A), 36 (circle B) and 27 (circle C)?

1 ; 3

(b) Which numbers are common factors of 30 (circle A) and 36 (circle B)?

1; 2; 3; 6

(c) Which numbers are common factors 36 (circle B) and 27 (circle C)?

1; 3; 9

(d) Write the numbers in block D, but is not part of A, B or C.

7; 11; 13; 17; 19; 31

(e) Arrange the numbers in block D in **descending order**.

31; 19; 17; 13; 11; 7

(f) Arrange the common factors of 30 and 36 in **ascending order**.

1; 2; 3; 6

ADDITION AND SUBTRACTION (Speed test)

Exercise A1E: **Date:** _____

Only write down the answer:

2 + 7 = 9	12 - 4 = 8	36 - 16 = 20	12 + 18 = 30
4 + 8 = 12	18 + 2 = 20	21 + 7 = 28	24 + 12 = 36
9 - 5 = 4	11 + 4 = 15	23 - 13 = 10	23 + 11 = 34
7 + 4 = 11	13 + 7 = 20	28 - 2 = 26	21 + 14 = 35
2 + 3 = 5	12 + 3 = 15	21 + 6 = 27	24 - 9 = 15
2 + 7 = 9	17 - 5 = 12	24 + 4 = 28	21 + 13 = 34
4 + 5 = 9	14 + 3 = 17	22 + 7 = 29	26 + 14 = 40
3 + 2 = 5	13 - 5 = 8	21 - 7 = 14	43 + 19 = 62
64 + 8 = 72	15 + 9 = 24	23 + 8 = 31	56 + 16 = 72
83 - 6 = 77	16 + 4 = 20	27 - 9 = 18	76 - 7 = 69
Total: ☐	Total: ☐	Total: ☐	Total: ☐

Total out of 40: ☐

A1.5 Multiples:

A **multiple of a number** is a number that can be added to itself repeatedly and then to each answer.

E.g. Multiples of 6 : M_6: 6 ; 12 ; 18 ; 24 ; 30 ; 36 ; . . .

Exercise 5: **Date:** _____

(1) (a) Write the first five multiples of 4: 4; 8; 12; 16; 20

(b) Write the next three multiples of 6:

M_6: 6 ; 12 ; 18 ; 24; 30; 36

(c) What is the smallest multiple of 7? 7

(d) Write down the multiples of 7, between 14 and 70:

21; 28; 35; 42; 49; 56; 63

(e) Complete the missing multiples:

M_8: 8 ; 16 ; 24 ; 32 ; 40; 48 ; 56 ; 64 ; 72 ; 80 88 ; 96

M_9: 9 ; 18 ; 27 ; 36 ; 45 ; 54 ; 63 ; 72 ; 81 ; 90 ; 99

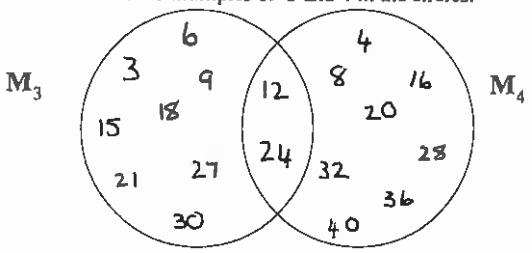
(f) (i) Write down the first ten multiples of 3 and 4:

M_3: 3; 6; 9; (12) 15; 18; 21; (24) 27, 30

M_4: 4; 8; (12) 16; 20; (24) 28; 32; 36; 40

(ii) Encircle the numbers which are multiples of 3 and multiples of 4.

(2) (a) Present the first 10 multiples of 3 and 4 in the circles:



(b) Now encircle the **LCM – Lowest common multiple.**

(3) Determine the first 8 multiples of:

(a) M_6: 6; 12; 18; 24; 30; 36; 42; 48

M_8: 8; 16; 24; 32; 40; 48; 56; 64

The common multiples are: 24; 48

LCM: 24

(b) M_7: 7; 14; 21; 28; 35; 42; 49; 56

M_2: 2; 4; 6; 8; 10; 12; 14; 16;

LCM: 14

(c) M_4: 4; 8; 12; 16; 20; 24; 28; 32

M_3: 3; 6; 9; 12; 15; 18; 21; 24

LCM: 12

(d) M_7: 7; 14; 21; 28; 35; 42; 49; 56

M_8: 8; 16; 24; 32; 40; 48; 56; 64

LCM: 56

(e) M_6: 6; 12; 18; 24; 30; 36; 42; 48

M_5: 5; 10; 15; 20; 25; 30; 35; 40

LCM: 30

(4) Which number is both a multiple and a factor of 8?

8

MULTIPLES AND YOUR CALCULATOR:
You can use your calculator to calculate multiples by adding the number to itself each time.

ADDITION AND SUBTRACTION (Speed test)

Exercise A1F: Date: _____

Only write down the answer:

60 – 4 = 56	23 – 6 = 17	42 – 7 = 35	23 + 8 = 31
40 – 6 = 34	35 + 9 = 44	76 – 7 = 69	94 – 8 = 86
10 – 5 = 5	54 – 6 = 48	81 – 7 = 74	82 + 9 = 91
78 – 12 = 66	63 + 6 = 69	21 – 7 = 14	55 – 8 = 47
10 – 1 = 9	71 – 6 = 65	35 + 7 = 42	61 – 8 = 53
10 – 0 = 10	92 – 6 = 86	64 – 7 = 57	77 + 9 = 86
33 – 9 = 24	45 + 6 = 51	34 + 7 = 41	111 – 8 = 103
80 – 7 = 73	88 – 9 = 79	94 – 7 = 87	215 – 8 = 207
98 + 10 = 108	100 – 6 = 94	103 – 7 = 96	333 – 8 = 325
10 – 8 = 2	73 + 9 = 82	57 + 7 = 64	512 – 8 = 504
Total:	Total:	Total:	Total:

Total out of 40:

A1.6 Prime numbers:

Numbers with only 2 factors namely 1 and the number itself is called **prime numbers**.

E.g. 2 ; 3 ; 5 ; 7 ; 11 ; 13 ; 17 ; 19 etc.

'1' is not a prime number, because it only has 1 factor which is 1.

Numbers with more than 2 factors are called **composite numbers**.

Factors which are prime numbers are called **prime factors**.

The factors of 6 are: F_6 : 1 ; 2 ; 3 ; 6 but the prime factors of 6 are 2 and 3.

Exercise 6: **Date:** _____

(1) (a) Write the first 6 prime numbers: 2; 3; 5; 7; 11; 13

(b) Which prime number is also an even number? 2

(c) Write the prime numbers between 17 and 29? 19; 23

(d) Write the factors of 12 which will also be prime numbers: 2; 3

(e) Why will 1 not be a prime number? Only one factor

(2) Write the factors of the following numbers and encircle the prime factors:

(a) F_{21}: 1; (3); (7); 21

(b) F_{15}: 1; (3); (5); 15

(c) F_{28}: 1; (2); 4; (7); 14; 28

(d) F_{22}: 1; (2); (11); 22

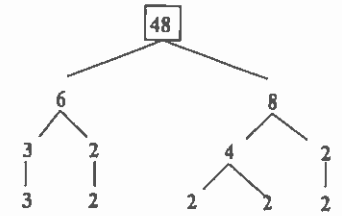
(e) F_{30}: 1; (2); (3); (5); 6; 10; 15; 30

(f) F_{32}: 1; (2); 4; 8; 16; 32

(g) F_{42}: 1; (2); (3); 6; (7); 14; 21; 42

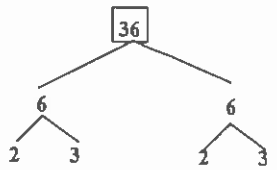
(h) F_{56}: 1; (2); 4; (7); 8; 14; 28; 56

Prime factors can be determined by using a factor tree:



$\therefore$ 3 x 2 x 2 x 2 x 2 = 48

Prime factors: 2 and 3



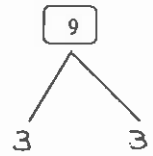
$\therefore$ 2 x 3 x 2 x 3 = 36

Prime factors: 2 and 3

Exercise 7: **Date:** _____

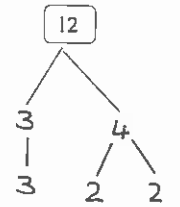
Draw factor trees to indicate the prime factors of the following numbers:

(1)



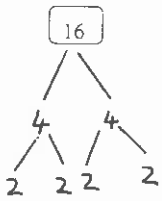
Prime factors 9: 3

(2)



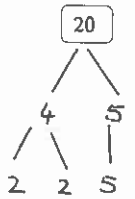
Prime factors 12: 2; 3

(3)



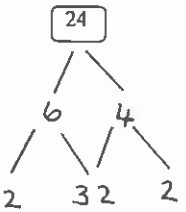
Prime factors 16: 2

(4)



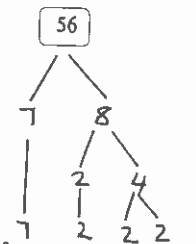
Prime factors 20: 2; 5

(5)



Prime factors 24: 2; 3

(6)



Prime factors 56: 2; 7