

SHARP

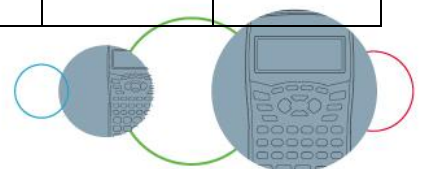
Worksheet 1 Memorandum: Whole Numbers Revision

Grade 9 Mathematics CAPS

1.
 - a) prime numbers - numbers that only have two factors – 1 and the number itself.
 - b) whole numbers - counting numbers that start from 0 and do not have decimals or fractions.
 - c) integers - positive and negative whole numbers
 - d) real numbers - any number that exists.
 - e) rational numbers - numbers that are recurring or terminate.
 - f) irrational numbers - numbers that do not terminate (or end) and do not have a pattern
 - g) undefined - a number that does not exist such as dividing by zero.
 - h) multiple - the product of two numbers
 - i) factor - a number that divides perfectly with no remainder into another number
 - j) prime factor - a factor that is a prime number.
 - k) LCM - the lowest common multiple – the lowest multiple that occurs for both (or all) the numbers listed.
 - l) HCF - Highest Common factor – the highest factor that goes into all the numbers listed.
 - m) natural numbers - counting numbers that start from 1 and do not have decimals or fractions.
 - n) non-real numbers - numbers that do not exist – for example the square-root of a negative number.
 - o) ratio - a ratio shows the proportion of one amount to another amount.

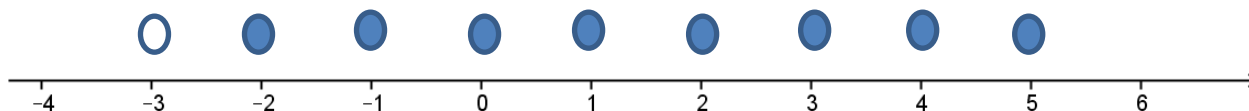
2.

Number	Real	Non-Real	Rational	Irrational	Whole Number	Natural Number	Integer
$\sqrt{5}$	✓	x	x	✓	x	x	x
$\sqrt{-5}$	x	✓	x	x	x	x	x
-7	✓	x	✓	x	x	x	✓
0	✓	x	✓	x	✓	x	✓
π	✓	x	x	✓	x	x	x

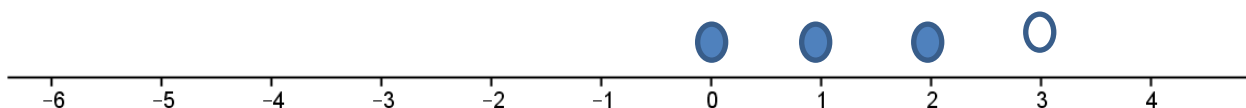


$\frac{4}{5}$	✓	x	✓	x	x	x	x
$3 \div 7$	✓	x	x	x	x	x	x
-4.5	✓	x	✓	x	x	x	x
0.478	✓	x	✓	x	x	x	x
$\sqrt{9}$	✓	x	✓	x	✓	✓	✓

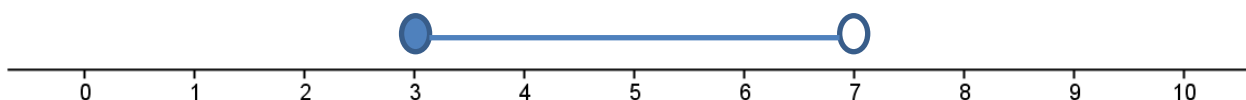
3. a) $-3 < x \leq 5 \quad x \in \mathbb{Z}$



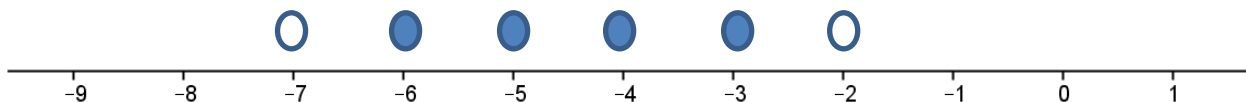
b) $-5 \leq x < 3 \quad x \in \mathbb{N}_0$



c) $x \in [3; 7) \quad x \in \mathbb{R}$



d) $x \in (-7; -2) \quad x \in \mathbb{Z}$



4. a) 21: 21; 42; 63; 84; 105

b) 43: 43; 86; 129; 172; 215

c) 98: 98; 196; 294; 392; 490

5. a)
$$\begin{array}{r|l} 236 & 2 \\ 118 & 2 \\ 59 & 59 \\ 1 & \end{array}$$

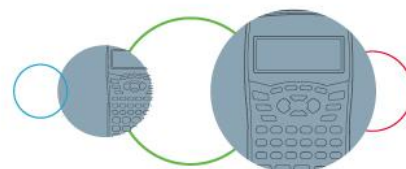
 $236 = 2^2 \times 59$

b)
$$\begin{array}{r|l} 267 & 3 \\ 89 & 89 \\ 1 & \end{array}$$

 $267 = 3 \times 89$

c)
$$\begin{array}{r|l} 540 & 3 \\ 180 & 2 \\ 90 & 2 \\ 45 & 5 \\ 9 & 3 \\ 3 & 3 \\ 1 & \end{array}$$

 $540 = 2^2 \times 3^3 \times 5$



d)

940	2
470	2
235	5
47	47
1	

$$940 = 2^2 \times 5 \times 47$$

e)

258	2
129	3
43	43
1	

$$258 = 2 \times 3 \times 43$$

f)

465	5
93	3
31	31
1	

$$465 = 5 \times 3 \times 31$$

6. a) 100 and 132

100	2	132	2
50	2	66	2
25	5	33	3
5	5	11	11
1		1	

$$\text{HCF} = 2 \times 2 = 4$$

$$\text{LCM} = 4 \times 5^2 \times 3 \times 11 = 3300$$

b) 378 and 252

378	2	252	2
189	3	126	2
63	3	63	3
21	3	21	3
7	7	7	7
1		1	

$$\text{HCF} = 2 \times 3^2 \times 7 = 126$$

$$\text{LCM} = 2^2 \times 3^3 \times 7 = 756$$

c) 625 and 195

625	5	195	5
125	5	39	3
25	5	13	13
5	5	1	
1			

$$\text{HCF} = 5$$

$$\text{LCM} = 5^4 \times 3 \times 13 = 24\,375$$

d) 175 and 63

175	5	63	3
35	5	21	3
7	7	7	7
1		1	

$$\text{HCF} = 7$$

$$\text{LCM} = 3^2 \times 5^2 \times 7 = 1\,575$$

e) 266 and 142

266	2	142	2
133	7	71	71
19	19	1	
1			

$$\text{HCF} = 2$$

$$\text{LCM} = 2 \times 7 \times 19 \times 71 = 37\,772$$

f) 156 and 378

156	2	378	2
78	2	189	3
39	3	63	3
13	13	21	3
1		7	7
		1	

$$\text{HCF} = 2 \times 3 = 6$$

$$\text{LCM} = 2^2 \times 3^3 \times 13 \times 7 = 9\,828$$

7. a) 68 : 34

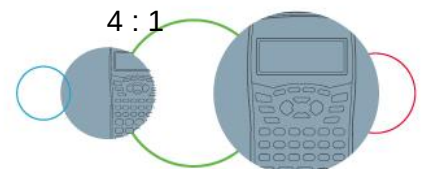
$$2 : 1$$

b) 42 : 63

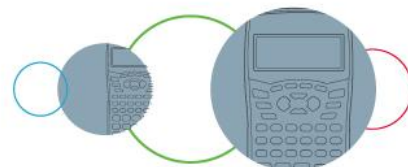
$$2 : 3$$

c) 64 : 16

$$4 : 1$$



- d) $44 : 11$
 $4 : 1$
- e) $56 : 7$
 $8 : 1$
- f) $54 : 18$
 $3 : 1$
- g) $60 : 90$
 $2 : 3$
- h) $2 : 12$
 $1 : 6$
- i) $15 : 45$
 $1 : 3$
8. a) $3 : 8 \rightarrow x : 24$
 $x = 9$
- b) $96 : 84 \rightarrow 8 : x$
 $x = 7$
- c) $72 : 64 \rightarrow x : 16$
 $x = 18$
- d) $92 : x \rightarrow 23 : 16$
 $x = 64$
- e) $x : 77 \rightarrow 7 : 11$
 $x = 49$
- f) $20 : x \rightarrow 100 : 20$
 $x = 4$
9. a) 405 words in 15 minutes (words/minute) $\rightarrow 27$ words/minute
- b) 1206km in 9 hours (km/h) $\rightarrow 134$ km/h
- c) 58km per hour (m/s) $\rightarrow 58\,000$ m per 60 min = $966\frac{2}{3}$ m/s
- d) 5ml of baking powder per 100g of flour (g/ml) $\rightarrow 20$ g/ml
- e) 40 bricks per half hour (bricks/min) $\rightarrow 1\frac{1}{3}$ bricks/min
10. a) indirect proportion b) direct proportion c) direct proportion
- d) indirect proportion e) direct proportion
11. a) 479 by 18% = 565.22 b) 5 400 by 96% = 10 584
- c) 33 000 by 30% = 42 900 d) 166 by 50% = 249
- e) 112 by 38% = 154.56 f) 208 by 150% = 520
12. a) 26% of 573 = 148.98 b) 32% of 48 000 = 15 360
- c) 92% of 13 289 = 12 225.88 d) 52% of 2 000 = 1 040
- e) 15% of 458 = 68.7 f) 120% of 64 = 76.8
13. a) 141 by 48% = 73.32 b) 40 by 38% = 24.8
- c) 770 by 88% = 92.4 d) 72 by 14% = 61.92
- e) 360 by 68% = 115.2 f) 24 000 by 64% = 8 640
14. a) $P = 11\,000$ $SI = \frac{P \cdot n \cdot r}{100}$ b) $P = 20\,800$ $SI = \frac{P \cdot n \cdot r}{100}$
- $n = 12$ years $SI = \frac{11\,000 \times 12 \times 9}{100}$ $n = 15$ years $SI = \frac{20\,800 \times 15 \times 18}{100}$
- $r = 9$ $SI = 11\,880$ $r = 18$ $SI = 56\,160$



c)	$P = 62\,900$	$SI = \frac{P \cdot n \cdot r}{100}$	d)	$P = 36\,000$	$SI = \frac{P \cdot n \cdot r}{100}$
	$n = 10 \text{ years}$	$SI = \frac{62\,900 \times 10 \times 5}{100}$		$n = 0.5$	$SI = \frac{36\,000 \times 0.5 \times 8}{100}$
	$r = 5$	$SI = 31\,450$		$r = 8$	$SI = 1\,440$

e)	$P = 73\,450$	$SI = \frac{P \cdot n \cdot r}{100}$
	$n = 7 \text{ years}$	$SI = \frac{73\,450 \times 7 \times 20}{100}$
	$r = 20$	$SI = 102\,830$

15. a) $P = 18\,180$ $A = P(1 + i)^n$
 $i = 15\% = 0.15$ $A = 18\,180(1 + 0.15)^{12}$
 $n = 12 \text{ years}$ $A = 97\,267.55$

b) $P = 9\,900$ $A = P(1 + i)^n$
 $i = 8\% = 0.08$ $A = 9\,900(1 + 0.08)^4$
 $n = 4 \text{ years}$ $A = 13\,468.84$

c) $P = 49\,700$ $A = P(1 + i)^n$
 $i = 13\% = 0.13$ $A = 49\,700(1 + 0.13)^6$
 $n = 6 \text{ years}$ $A = 103\,473$

d) $P = 3\,000$ $A = P(1 + i)^n$
 $i = 18\% = 0.18$ $A = 3\,000(1 + 0.18)^{10}$
 $n = 10 \text{ years}$ $A = 15\,701.51$

e) $P = 11\,250$ $A = P(1 + i)^n$
 $i = 10\% = 0.1$ $A = 11\,250(1 + 0.1)^{0.5}$
 $n = 6 \text{ months} = 0.5 \text{ years}$ $A = 11\,799.10$

