

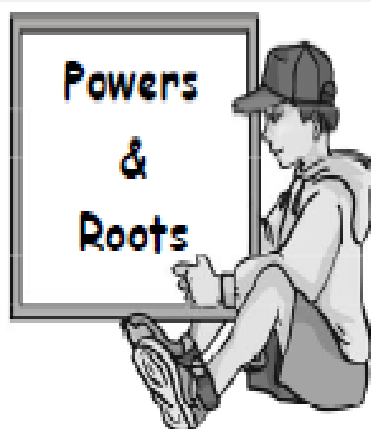
S1 Test Revision



St Ninian's High School

Whole Numbers

CHAPTER 1



Exercise 1

Squares, Cubes & Powers

1. Do not use a calculator in this question. Copy and complete the following :-

a $4^2 = 4 \times 4 = \dots$

b $7^2 = 7 \times 7 = \dots$

c $10^2 = 10 \times \dots = \dots$

d $2^2 = \dots \times \dots = \dots$

e $3^2 = \dots$

f $1^2 = \dots$

g $(-1)^2 = \dots$

h $(-8)^2 = \dots$

i $(\frac{1}{2})^2 = \dots$

j $5^3 = 5 \times 5 \times 5 = \dots$

k $(-1)^3 = \dots$

l $(-2)^4 = \dots$

2. You can use a calculator this time. Find the value of :-

a 14^2

b 19^2

c 33^2

d 25^2

e 8^3

f 12^3

g $(-7)^3$

h $(\frac{1}{2})^4$

3. Calculate the area of a square with side :-

a 3 cm

b 9 mm

c 11 m

d 3.5 cm.

4. Find :-

a $4^2 + 5^2$

b $9^2 + 8^2$

c $10^2 - 7^2$

d $9^2 - 2^2$

e $12^2 - 10^2$

f $2^2 + 3^2 + 5^2$

g $10^2 + 8^2 + 6^2$

h $13^2 - 12^2 - 5^2$

Whole Numbers

Exercise 2

Square Roots and Cubes

1. Copy each line and complete **without** a calculator :-

a $\sqrt{16}$

b $\sqrt{36}$

c $\sqrt{100}$

d $\sqrt{1}$

e $\sqrt{64}$

f $\sqrt{4}$

g $\sqrt{25}$

h $\sqrt{400}$.

2. Write down the answer to each of the following :-

a $\sqrt{2500}$

b $\sqrt{10000}$

c $\sqrt{49000000}$

d $\sqrt{810000}$.

3. Use the " $\sqrt{\quad}$ " button on your calculator to find (to 1 decimal place) :-

a $\sqrt{72}$

b $\sqrt{50}$

c $\sqrt{131}$

d $\sqrt{12}$

e $\sqrt{476}$.

4. Use your calculator to find the following (to two decimal places) :-

a $\sqrt{22}$

b $\sqrt{37}$

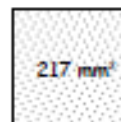
c $\sqrt{45}$

d $\sqrt{171}$

e $\sqrt{1325}$.

5. A square has an **area** of 217 mm^2 .

Calculate the length of a side to the nearest whole number.



6. The answers to these questions are all whole numbers. Find :-

a $\sqrt[3]{1000}$

b $\sqrt[3]{8}$

c $\sqrt[3]{27}$

d $\sqrt[4]{81}$

e $\sqrt[5]{32}$.

Answers

Chapter 1 : Powers & Roots

Ch 1 Ex 1 Squares, Cubes & Powers

- | | | | | | | |
|----|---|--------------------|---|-----------------------|---|------|
| 1. | a | 16 | b | 49 | c | 100 |
| | d | 4 | e | 9 | f | 1 |
| | g | 1 | h | 64 | i | 1/4 |
| | j | 125 | k | -1 | l | 16 |
| 2. | a | 196 | b | 361 | c | 1089 |
| | d | 625 | e | 512 | f | 1728 |
| | g | -343 | h | 1/16 | | |
| 3. | a | 9 cm ² | b | 81 mm ² | | |
| | c | 121 m ² | d | 12.25 cm ² | | |
| 4. | a | 41 | b | 145 | c | 51 |
| | d | 77 | e | 44 | f | 38 |
| | g | 200 | h | 0 | | |

Ch 1 Ex 2 Square Roots and Cubes

- | | | | | | | |
|----|---|-------|---|-------|---|------|
| 1. | a | 4 | b | 6 | c | 10 |
| | d | 1 | e | 8 | f | 2 |
| | g | 5 | h | 20 | | |
| 2. | a | 50 | b | 100 | | |
| | c | 7000 | d | 900 | | |
| 3. | a | 8.5 | b | 7.1 | c | 11.4 |
| | d | 3.5 | e | 21.8 | | |
| 4. | a | 4.69 | b | 6.08 | c | 6.71 |
| | d | 13.08 | e | 36.40 | | |
| 5. | | 15 cm | | | | |
| 6. | a | 10 | b | 2 | c | 3 |
| | d | 3 | e | 2 | | |

Whole Numbers

Exercise 1

Multiples & Lowest Common Multiples (l.c.m.)

- Write down all the multiples of 4 between 30 and 50.
 - Write down all the multiples of 7 between 30 and 65.
- List the first ten multiples of 3 and the first 10 multiples of 4.
 - List the **common multiples** of 3 and 4.
 - What is the l.c.m. of 3 and 4?
- Find the l.c.m. of each of the following pairs of numbers :-
 - 2 and 3
 - 8 and 6
 - 3 and 7
 - 5 and 8
 - 10 and 12
 - 3 and 11
 - 8 and 9
 - 6 and 9.
- Find the l.c.m. of :-
 - 2, 3 and 4
 - 3, 5 and 9
 - 2, 7 and 9.
- 3 disco lights are set off at the same time and then flash at different intervals :-
 - the blue light flashes every 5 seconds.
 - the green light flashes every 6 seconds.
 - the red light flashes every 8 seconds.

After they flash at the start, how long will it be until they flash together again?



Exercise 2

Factors & Highest Common Factor (h.c.f.)



- Find all the factors of :-
 - 10
 - 18
 - 23
 - 24
 - 72
 - 100.
- List all the factors of 18 and all the factors of 24.
 - Make a list of the common factors of 18 and 24. (those that appear in both lists).
 - What is the **highest common factor** (or h.c.f.) of 18 and 24.
- Find the highest common factor (h.c.f.) for each of the following :-
 - 12 and 15
 - 28 and 35
 - 24 and 96
 - 37 and 41
 - 100 and 105
 - 199 and 200.
- Find the h.c.f. of :-
 - 12, 15, 21
 - 24, 36, 40.

Whole Numbers

Exercise 3 Prime Numbers

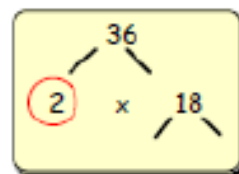


- Write all the factors of 15. Why is 15 **not** a prime number?
 - Explain why the number **1** is **not** a prime number.
 - Explain why 13 **is** a prime number.
- State whether each number below is a **prime** number or not. (Write **yes** or **no**) :-
 - 5
 - 16
 - 15
 - 17
 - 23
 - 27
 - 29
 - 35
 - 44
 - 47
 - 51
 - 62.
- How many **even** numbers are **prime**?
- Write down all the prime numbers between 50 and 60.

Exercise 4 Prime Decomposition



- Copy and complete the prime factor tree shown.



$$36 = 2 \times \dots \times \dots$$

- Use a similar method to find the prime decomposition of the following numbers :-
 - 12
 - 50
 - 27
 - 80
 - 56
 - 88
 - 35
 - 110
 - 155
 - 345
 - 1000
 - 256.

Answers

Ch 3 Ex 1 Multiples & l.c.m.

1. a 32, 36, 40, 44, 48
b 35, 42, 49, 56, 63
2. a 3, 6, 9, 12, 15, 18, 21, 24, 27, 30
4, 8, 12, 16, 20, 24, 28, 32, 36, 40
b 12, 24, 36, ...
c 12
3. a 6 b 24 c 21
d 40 e 60 f 33
g 72 h 18
4. a 12 b 45 c 126
5. 120 seconds

Ch 3 Ex 2 Factors & h.c.f.

1. a 1, 2, 5, 10 b 1, 2, 3, 6, 9, 18 c 1, 23
d 1, 2, 3, 4, 6, 8, 12, 24
e 1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72
f 1, 2, 4, 5, 10, 20, 25, 50, 100
2. a (i) 1, 2, 3, 6, 9, 18 (ii) see 1d
b 1, 2, 3, 6 c 6
3. a 3 b 7 c 24
d 1 e 5 f 1
4. a 3 b 4
5. 1, 2, 3, 4, 6, 8, 9, 10, 12, 15, 18, 20, 24,
30, 40, 45, 60, 90, 120, 180, 360

Ch 3 Ex 3 Prime Numbers

1. a 1, 3, 5, 15 More than 2 factors
b only 1 factor
c has exactly 2 factors
2. a yes b no c no
d yes e yes f no
g yes h no i no
j yes k no l no
3. only one (the number 2)
4. 53, 59

Ch 3 Ex 4 Prime Decomposition

1. a $2 \times 2 \times 3 \times 3$
2. a $2 \times 2 \times 3$ b $2 \times 5 \times 5$ c $3 \times 3 \times 3$
d $2 \times 2 \times 2 \times 2 \times 5$
e $2 \times 2 \times 2 \times 7$
f $2 \times 2 \times 2 \times 11$
g 5×7 h $2 \times 5 \times 11$ i 5×31
j $3 \times 5 \times 23$ k $2 \times 2 \times 2 \times 5 \times 5$
l $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$

Decimals

Exercise 1

Decimal Places & Rounding



- Round each of the following to **one** decimal place :-
 - 8.63
 - 3.77
 - 9.051
 - 2.949
 - 11.123
 - 54.96
 - 0.0612
 - 99.97.
- Round each of the following to **two** decimal places :-
 - 1.768
 - 12.125
 - 7.706
 - 9.0052
 - 3.04399
 - 0.01517
 - 99.987
 - 99.999.
- Round each of these numbers to the number of decimal places in the brackets :-
 - 7.845 (2)
 - 3.1903 (1)
 - 51.542 (2)
 - 5.87654 (3).
- Share £8000 equally between 6 people.
How much can each person get ?
 - Share one million pounds equally between 9 people.
How much can each person get ?
 - How much will each person get if you share $£10\frac{1}{4}$ million between 7 people ?
- Find three places in real life where rounding to decimal places is used.



Answers

Answers to Chapter 1

Exercise 1 - Decimal Places

- | | | | | | | | |
|---|------|---|------|---|-----|---|-------|
| a | 86 | b | 38 | c | 91 | d | 29 |
| e | 11.1 | f | 55.0 | g | 0.1 | h | 100.0 |
- | | | | | | | | |
|---|------|---|-------|---|-------|---|--------|
| a | 1.77 | b | 12.13 | c | 7.71 | d | 9.01 |
| e | 3.04 | f | 0.02 | g | 99.99 | h | 100.00 |
- | | | | | | | | |
|---|------|---|-----|---|-------|---|-------|
| a | 7.85 | b | 3.2 | c | 51.54 | d | 5.677 |
|---|------|---|-----|---|-------|---|-------|
- | | | | |
|---|-------------|---|------------|
| a | £1333.33 | b | £111111.11 |
| c | £1464285.71 | | |
- Various

Decimals

Exercise 5

1. Write down the answers to the following :-

- (a) 8.4×10 (b) 9.8×10 (c) 7.62×10 (d) 18.71×10
(e) 6.41×100 (f) 0.91×100 (g) 4.021×100 (h) 0.0054×100
(i) 5.213×1000 (j) 0.8765×1000 (k) 1.0041×1000 (l) 4.2×1000

2. A crate weighs 47.62 kg. What would be the weight of :-

- (a) 10 crates (b) 100 crates (c) 1000 crates (d) 10 000 crates ?

3. There are 1000 millilitres in a litre. How many millilitres are there in :-

- (a) 5 litres (b) 7.62 litres (c) 0.0415 litres (d) 0.01 litres ?

Exercise 6

1. Write down the answers to the following :-

- (a) $28.6 \div 10$ (b) $19.8 \div 10$ (c) $7.62 \div 10$ (d) $187.1 \div 10$
(e) $64.1 \div 100$ (f) $10.91 \div 100$ (g) $4.2 \div 100$ (h) $0.54 \div 100$
(i) $521.3 \div 1000$ (j) $0.8 \div 1000$ (k) $1.004 \div 1000$ (l) $9 \div 1000$

2. The length of 100 pieces of railway track is 412.6 metres long.

- (a) What is the length of each piece in metres ?
(b) Change your answer to centimetres.

3. There are 1000 squibiis in a martian pound.
How many martian pounds in :-

- (a) 3497 squibiis (b) 214.6 squibiis
(c) 21977 squibiis (d) 1 squibii ?



Exercise 7

1. Write down the answers to the following :-

$$\begin{array}{r} 4.34 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 8.27 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 8.78 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 119.38 \\ \times 9 \\ \hline \end{array}$$

(e) 5.7×8

(f) 42.3×4

(g) 135.9×5

(h) 7×37.521

2. Show all your working to the following questions :-

(a) Fred the monkey eats 3.74 kg of food every day.

What is the weight of food Fred will eat in :-

- (i) 3 days (ii) a week ?



(b) Boris the zookeeper gets paid £7.84 an hour.

How much will Boris earn in :-

- (i) 4 hours (ii) 9 hours ?

(c) Kevin the Camel eats six 3.71 kg boxes of dates every month.
Karen the Camel eats five 4.09 kg boxes.

Who eats the most and by how much ?



Exercise 8

1. Copy and complete the following :-

(a) $\underline{2} \overline{)37.16}$

(b) $\underline{6} \overline{)91.44}$

(c) $\underline{7} \overline{)41.79}$

(d) $\underline{8} \overline{)129.12}$

2. Find :-

(a) $35.7 \div 7$

(b) $57.06 \div 6$

(c) $0.072 \div 8$

3. Show all your working for the following questions :-

(a) Nine bricks have a total length of 2.61 metres long.

What is the length of 1 brick ?



(b) Three kegs of beer hold 3071.6 litres.

How much beer does one keg hold ?



(c) Find :-

(i) a third of 20.8

(ii) a ninth of 51.66

(iii) a sixth of 6.06

(iv) a fifth of 0.7

4. Two shops sell identical shirts.

Shop A sells three shirts for £8.79.

Shop B sells five shirts for £14.75.

Which shop has the best deal ? Explain.



Answers

Chapter 2 Exercise 5

1. a 84 b 98 c 76.2 d 187.1
 e 641 f 9.1 g 402.1 h 0.54
 i 5213 j 876.5 k 1004.1 l 4200
2. a 476.2 kg b 4762 kg
 c 47620 kg d 476200 kg
3. a 5000 b 7620 c 41.5 d 10

Chapter 2 Exercise 6

1. a 2.86 b 1.98 c 0.762 d 18.71
 e 0.641 f 0.1091 g 0.042 h 0.0054
 i 0.5213 j 0.0008 k 0.001004 l 0.009
2. a 4.126 m b 412.6 cm
3. a 3.497 b 0.2146 c 21.977 d 0.001

Chapter 2 Exercise 7

1. a 17.36 b 57.89 c 52.68 d 1074.42
 e 45.6 f 169.2 g 679.5 h 262.647
2. a (i) 11.22 kg (ii) 26.18 kg
 b (i) £31.36 (ii) £70.56
 c Kevin by 1.81 kg

Chapter 2 Exercise 8

1. a 18.58 b 15.24 c 5.97 d 16.14
2. a 5.1 b 9.51 c 0.009
3. a 0.29 m b 1024.2 l
 c (i) 6.6 (ii) 5.74 (iii) 1.01 (iv) 0.14
4. shop A each shirt 2p cheaper

Integers

Exercise 2

Adding & Subtracting Integers



1. Find :-

a $11 - 12$

b $6 - 11$

c $(-3) + 5$

d $1 - 3$

e $(-9) + 9$

f $(-4) - 2$

g $(-6) - 7$

h $(-3) + (-1)$

i $(-121) + 21$

j $134 - 165$

k $(-30) - 40$

l $(-50) + (-40)$

2. a $34 - 121$

b $2 \cdot 7 - 4 \cdot 2$

c $8 \cdot 7 + (-4 \cdot 8)$

d $(-1 \cdot 4) - 3 \cdot 8$

e $11 \cdot 6 - 13 \cdot 7$

f $63 \cdot 1 + (-36 \cdot 1)$

g $(-12 \cdot 1) + (-16 \cdot 9) - 9 \cdot 2$

h $11k - 12k$

i $111g - 121g$

j $15f + (-11f) - 3f + f$

Integers

Exercise 3

Subtracting Negatives



1. Find :-

- | | | | | | | | |
|---|-----------------|---|------------------|---|---------------|---|-------------------|
| a | $4 - (-2)$ | b | $8 - (-1)$ | c | $10 - (-5)$ | d | $70 - (-30)$ |
| e | $(-3) - (-2)$ | f | $(-1) - (-1)$ | g | $(-8) - (-7)$ | h | $(-11) - (-6)$ |
| i | $(-34) - (-21)$ | j | $(-121) - (-77)$ | k | $73 - (-54)$ | l | $(-243) - (-233)$ |

2. Find :-

- | | | | | | | | |
|---|-----------------|---|-----------------|---|-------------------------|---|------------------|
| a | $4x - (-2x)$ | b | $7y - (-4y)$ | c | $23k - (-14k)$ | d | $156i - (-127g)$ |
| e | $111d - (-88d)$ | f | $(-3w) - (-4w)$ | g | $(-40j) - 11j - (-20j)$ | | |

Exercise 4

Multiplying/Dividing Negatives



1. Find :-

- | | | | | | | | |
|---|-----------------|---|------------------|---|------------------|---|-------------------|
| a | $3 \times (-2)$ | b | $8 \times (-1)$ | c | $12 \times (-5)$ | d | $10 \times (-30)$ |
| e | $(-3) \times 4$ | f | $(-1) \times 6$ | g | $(-8) \times 7$ | h | $(-11) \times 4$ |
| i | $(-9) \div 3$ | j | $(-121) \div 11$ | k | $72 \div (-9)$ | l | $243 \div (-3)$ |

2. Find :-

- | | | | | | | | |
|---|--------------------|---|--------------------|---|--------------------|---|----------------------|
| a | $(-4) \times (-2)$ | b | $(-3) \times (-4)$ | c | $(-7) \times (-9)$ | d | $(-11) \times (-12)$ |
| e | $15 \div (-5)$ | f | $(-30) \div (-5)$ | g | $(-40) \div (-8)$ | h | $(-243) \div (-3)$ |

3. Find :-

- | | | | | | | | |
|---|----------------------|---|---------------------|---|-------------|---|--------------------------------|
| a | $(-11 + 3) \times 2$ | b | $(7 - 11) \times 5$ | c | $(-1)^{17}$ | d | $(-1) \times (-7) \times (-2)$ |
|---|----------------------|---|---------------------|---|-------------|---|--------------------------------|

Answers

Exercise 2 - Adding and Subtracting Integers

1. a -1 b -6 c 2 d -2
 e 0 f -6 g -13 h -4
 i -100 j -31 k -70 l -90
2. a -87 b -15 c 39 d -52
 e -21 f 27 g -382
 h -k i -10g j 2r

Exercise 3 - Subtracting Negatives

1. a 6 b 9 c 15 d 100
 e -1 f 0 g -1 h -5
 i -13 j -44 k 127 l -10
2. a $6x$ b $11y$ c $37k$ d $283i$
 e $199d$ f w g $-31j$

Exercise 4 - Multiplying/Dividing Negatives

1. a -6 b -8 c -60 d -300
 e -12 f -6 g -56 h -44
 i -3 j -11 k -8 l -81
2. a 8 b 12 c 63 d 132
 e -3 f 6 g 5 h 81
3. a -16 b -20 c -1 d -14

Algebra

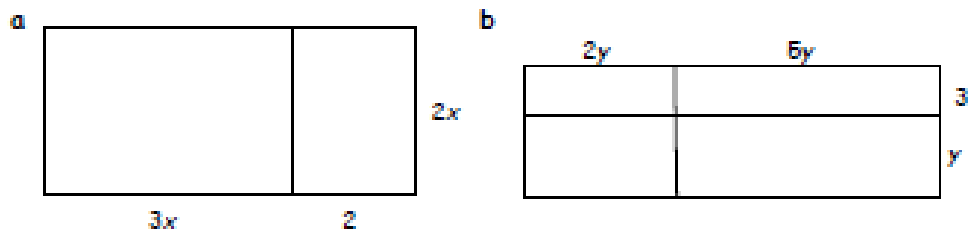
Exercise 1

Simplifying

1. Simplify each expression by collecting like terms :-

- | | | | | | | | |
|---|---------------|---|----------------|---|-------------------------|---|---------------------------|
| a | $y + y + y$ | b | $t + 3t - 2t$ | c | $3p + 5p + p$ | d | $4k + 9k - 4k$ |
| e | $2w + 6w + 3$ | f | $7u + 3 - 6u$ | g | $8y + 4b + 3y - 2b + 7$ | | |
| h | $3 \times 4y$ | i | $6k \times 7$ | j | $16p \div 2$ | k | $24w \div 8$ |
| l | $a \times 3b$ | m | $2v \times 3v$ | n | $2ab \times 3a$ | o | $3cd \times 4c \times 2d$ |
| p | $18p \div 3p$ | q | $6k^2 \div 3k$ | r | $40g^2 \div 8g^2$ | s | $4t \times 6t \div 8t$ |

2. Find the total area of each large rectangle in terms of x and y :-



Exercise 6

Evaluating Expressions and Formulae

1. Given $a = 2$, find :-

- | | | | | | |
|---|-------------------|---|-----------------|---|------------------|
| a | $a + 6$ | b | $2a$ | c | $5a - 3$ |
| d | $(7a + 4) \div 2$ | e | $4(a + 2)$ | f | $6(11 - a) - 53$ |
| g | $3(a + 1) - 12$ | h | $5(a + 2) + 15$ | i | $3(a - 11) + 27$ |

2. Given $b = 3$, $c = 5$ and $d = -1$, evaluate :-

- | | | | | | |
|---|-------------|---|---------------|---|-----------------------|
| a | $b + c + d$ | b | $2b - c - 3d$ | c | $\frac{1}{2}(bc + d)$ |
| d | $3bcd$ | e | $cab - abc$ | f | $0.5(bd - cd)$ |

3. a If $f = 2$, $g = 4$ and $h = -2$, find e , given $f + g + h + e = 10$.
 b If $p = 3$, $r = -3$ and $s = 2$, find t given $st - prs = 12$.

4. If $m = 4$ and $n = 6$, find the values of :-

- | | | | | | |
|---|---------------|---|--------------------|---|------------------------|
| a | m^2 | b | n^2 | c | \sqrt{m} |
| d | $m^2 + n^2$ | e | $2m^2$ | f | $3m^2$ |
| g | $\sqrt{mn+1}$ | h | $\sqrt{5m - 2n+1}$ | i | $\sqrt{m^2 + n^2 - 3}$ |

Answers

Exercise 1 - Simplifying

1. a $3y$ b $2t$ c $9p$ d $9k$
e $8w + 3$ f $u + 3$ g $11y + 2b + 7$
h $12y$ i $42k$ j $8p$ k $3w$
l $3ab$ m $6vt$ n $6atb$ o $24ctdt$
p 6 q $2k$ r 6 s $3t$
2. a $6x^2 + 3x$ b $7y^2 + 21y$

Exercise 2 - Dividing

Exercise 6 - Evaluating Expressions and Formulae

1. a 8 b 4 c 7
d 9 e 16 f 1
g -3 h 35 i 0
2. a 7 b 4 c 7
d -45 e 0 f 1
3. a 6 b -3
4. a 16 b 36 c 2
d 62 e 32 f 432
g 6 h 3 i 7