Cumbernauld Academy

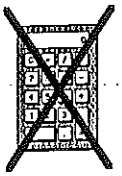
Mathematics Department

4th Level Upper

Block 1 - homework booklet

Topic 1

Exercise 1

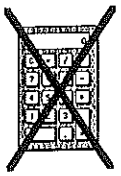


No calculator.

1. Find approximate answers to these by first rounding each number to 1 figure accuracy ;- e.g. $786 \div 19 \approx (800 \div 20) \approx 80 \div 2 \approx 40$

(a) 39×39	(b) 26×81	(c) 298×41	(d) 507×19
(e) 264×195	(f) $297 \div 28$	(g) $787 \div 19$	(h) $877 \div 27$
(i) $1997 \div 204$	(j) $5983 \div 11$	(k) $4986 \div 54$	(l) $5974 \div 29$

Exercise 2.



1. Write down the answers to these :-

(a) 19×10	(b) 38×10	(c) 10×93	(d) 10×274
(e) 10×150	(f) 907×10	(g) 10×2487	(h) 7901×10

2. Write down the answers to these :-

(a) 14×100	(b) 46×100	(c) 100×68	(d) 100×90
(e) 234×100	(f) 100×458	(g) 100×650	(h) 109×100

3. Write down the answers to these :-

(a) 4×1000	(b) 31×1000	(c) 74×1000	(d) 1000×56
(e) 1000×80	(f) 247×1000	(g) 1000×350	(h) 1000×400

Exercise 3

1. Write down the answers to these :-

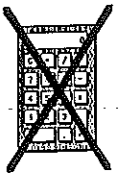
(a) $50 \div 10$	(b) $540 \div 10$	(c) $690 \div 10$	(d) $5200 \div 10$
(e) $5740 \div 10$	(f) $2000 \div 10$	(g) $58400 \div 10$	(h) $18740 \div 10$

2. Write down the answers to these :-

(a) $500 \div 100$	(b) $900 \div 100$	(c) $1400 \div 100$	(d) $3600 \div 100$
(e) $8000 \div 100$	(f) $27000 \div 100$	(g) $65000 \div 100$	(h) $587000 \div 100$

3. Write down the answers to these :-

(a) $3000 \div 1000$	(b) $23000 \div 1000$	(c) $45000 \div 1000$	(d) $80000 \div 1000$
(e) $147000 \div 1000$	(f) $150000 \div 1000$	(g) $580000 \div 1000$	(h) $400000 \div 1000$



Exercise 4

1. Calculate each of these using the method shown below :-
(*show the two steps of working each time*)

(a) 13 x 40 [Find 10 x 13 first = 130 and then find 130 x 4]

(b) 18 x 30 (c) 25 x 50 (d) 42 x 60

(e) 28 x 20 (f) 110 x 70 (g) 125 x 80

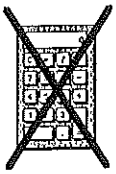
2. Work out each of these using the 2 steps shown :-

(a) 35 x 200 [Find 35 x 100 first = 3500 and then find 3500 x 2]

(b) 24 x 400 (c) 18 x 200 (d) 12 x 600

(e) 34 x 500 (f) 54 x 300 (g) 200 x 58

Exercise 5



1. Divide the following using the method shown below :-

(a) 420 ÷ 20 [Find 420 ÷ 10 = 42 and then find 42 ÷ 2]

(b) 120 ÷ 40 (c) 2250 ÷ 50 (d) 3600 ÷ 60

(e) 9600 ÷ 30 (f) 3150 ÷ 70 (g) 32000 ÷ 80

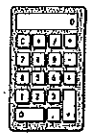
2. Divide the following :-

(a) 12400 ÷ 400 [Find 12400 ÷ 100 = 124 and then find 124 ÷ 4]

(b) 36000 ÷ 300 (c) 48200 ÷ 200 (d) 52500 ÷ 500

(e) 18000 ÷ 200 (f) 42000 ÷ 600 (g) 424000 ÷ 800

Integers

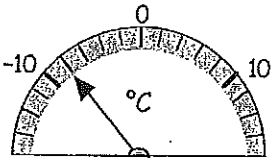


Calculators should **not** be used anywhere in this Chapter unless you are otherwise instructed.

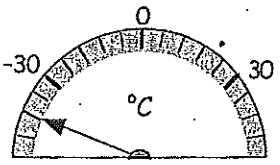
Exercise 6

1. Write down the temperatures represented by the diagrams below :-

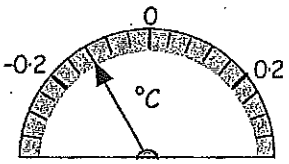
(a)



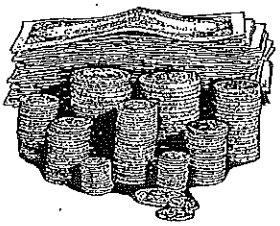
(b)



(c)



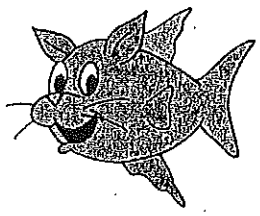
2. (a) Jack had £25 in his bank account and withdrew £40.
What did his balance show on the computer ?



(b) Jill's bank balance showed (-£20).
Jill deposits £30 into her account.
What will her balance show now ?

(c) Bill is overdrawn by £40 and puts £30 into his account.
What will his balance show now ?

(d) Last week my balance was (-£60).
I cleared my overdraft and then signed a cheque for £35.
After I put some money into my account my balance read +£20.
How much had I put into my account **in total** since my (-£60) balance ?

3. 

A Catfish swims 20 metres below the water.
A bird flies 30 metres directly above the fish.
How high above the water is the bird ?

4. Write down how old each person was when they died :-

(a) Sillius Plonkus born 40 B.C. - died 25 A.D.

(b) Smellius Stinkus born 33 B.C. - died 32 A.D.

(c) Stupus Idious died 12 A.D. - was born 56 B.C.

5. Lazious Tyrus was born in 43 B.C.
Activus Sporticus died at the age of 61 on Lazious' 23rd birthday.

(a) What year was Activus born ?

(b) Lazious died on what would have been Activus' 80th birthday.
What year was this ?

Exercise 7

1. What temperature is :-

(a) 5°C up from 10°C (b) 11°C up from -1°C (c) 12°C up from -4°C

(d) 10°C down from 13°C (e) 20°C down from -10°C (f) 34°C up from -21°C ?

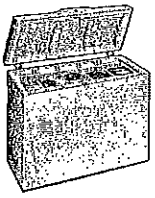
2. Complete the following, inserting "... °C up" or "... °C down" :-

(a) 10°C is ..... from 2°C (b) 8°C is ..... from -1°C

(c) 2°C is ..... from 9°C (d) 23°C is ..... from -7°C

(e) -25°C is ..... from 18°C (f) -82°C is ..... from -26°C

3. (a) An ice making machine has its temperature set at -3°C.
The door is left opened and the temperature rose by 5°C.
What is the new temperature in the machine ?



(b) 

During a lab experiment a liquid's temperature is recorded at each stage of the experiment.

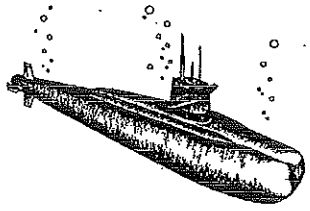
The temperature is raised by 8°C then dropped by 15°C then dropped by a further 4°C.

If the initial temperature was 3°C, what was the final temperature ?

4. At sea level, the hull of a submarine has a temperature of 5°C.
For every 10 metres the submarine dives the temperature drops by 2°C.
What would the hull temperature be after diving :-

(a) 10 metres (b) 30 metres

(c) 50 metres (d) 105 metres ?



Exercise 8

1. Write down the answers to each of the following :-

(a) $7 + 5$	(b) $3 - 4$	(c) $(-2) + 3$	(d) $-1 + 4$
(e) $(-5) + 7$	(f) $(-11) + 5$	(g) $3 + (-4)$	(h) $7 + (-8)$
(i) $15 + (-12)$	(j) $11 + (-3)$	(k) $(-14) + 7$	(l) $(-1) + (-1)$
(m) $3 - 5$	(n) $4 - 9$	(o) $(-3) - 6$	(p) $(-12) - 5$
(q) $(-10) - 3$	(r) $(-7) - 7$	(s) $(-3{\cdot}2) + 1{\cdot}6$	(t) $5{\cdot}7 + (-8{\cdot}8)$
(u) $(-3) + (-2)$	(v) $(-4) + (-7)$	(w) $(-3{\cdot}1) + (-6{\cdot}7)$	(x) $(-7{\cdot}8) + (-6{\cdot}8)$

2. Find:-

(a) $2 + 3 - 9$	(b) $4 - 5 + 2$	(c) $8 - 9 - 3$	(d) $4 - 8 - 7$
(e) $(-1) + 2 - 3$	(f) $(-3) + (-1) + 4$	(g) $(-5) - 6 + 4$	(h) $(-7) + (-8) + 9$
(i) $3 + (-4) + (-1)$	(j) $7 + (-5) + (-3)$	(k) $(-1) + (-2) + (-3)$	(l) $(-3{\cdot}1) + 4{\cdot}2 + (-2{\cdot}7)$

3. In a special card game, each set of 3 cards is added together and the smallest total wins.

   (a) Who wins the game shown ?

   (b) By how much did the winner beat the third place ?

Bob

-5 | 4 | -3

Bill

-2 | -2 | -2

Ben

-7 | -3 | 5

Exercise 9

1. Find :-

(a) $2 - (-3)$	(b) $4 - (-5)$	(c) $7 - (-7)$	(d) $14 - (-8)$
(e) $-1 - (-2)$	(f) $-3 - (-7)$	(g) $-5 - (-16)$	(h) $-17 - (-18)$
(i) $-3 - (-48)$	(j) $-7 - (-25)$	(k) $-1{\cdot}7 - (-2{\cdot}6)$	(l) $-3{\cdot}8 - (-7{\cdot}7)$

2. Simplify :-

(a) $6y - (-4y)$	(b) $4w - (-3w)$	(c) $7t + (-2t)$	(d) $-6g + 5g$
(e) $-p + (-p)$	(f) $-8c + (-2c)$	(g) $-h - (-2h)$	(h) $42k + (-12k) - 13k$

3. Simplify :-

(a) $21 + 13 - 11$ (b) $-4 - 5 + 2$ (c) $-8 - (-9) - 3$

(d) $3j - 2j - j$ (e) $-4 + 4 - 4$ (f) $-5 + (-5) + 1$

(g) $-15 - 7 + (-24)$ (h) $-7x + (-3x) + 9x$ (i) $17 + (-12) - 5$

(j) $3e - (-e) + (5e)$ (k) $1\cdot7 - (-3\cdot4) + (-2)$ (l) $11h - (-5h) - (-6h)$

(m) $(-1) + (-1) + (-1) + (-1) + (-1) + (-1) + (-1)$

Exercise 10

1. Find :-

(a) $5\ (-3)$ (b) $4 \times (-4)$ (c) $(-7) \times 5$ (d) $(-5) \times 11$

(e) $15 \times (-3)$ (f) $1 \times (-1)$ (g) $(-8) \times 8$ (h) $10 \times (-10)$

(i) $(-15) \div 3$ (j) $(-28) \div 7$ (k) $(-72) \div 9$ (l) $(-169) \div 13$

(m) $10 \times (-15)$ (n) $(-1) \div 1$ (o) $(-99) \times 8$ (p) $(-1000) \div 1000$

2. Calculate :-

(a) $(3 \times 6) \div 9$ (b) $(12 \times 6) \div 8$ (c) $3 \times 4 \times (-2)$ (d) $(-5) \times 15 \div 25$

(e) $20 \times (-20) \div 40$ (f) $((-6) + 8) \times 3$ (g) $(4 - (-2)) \times 5$ (h) $((-7) - (-3)) \div 2$

3. Find :-

(a) $30 \div (-3)$ (b) $54 \div (-6)$ (c) $80 \div (-4)$ (d) $36 \div (-6)$

(e) $84 \div (-3)$ (f) $225 \div (-25)$ (g) $74 \div (-37)$ (h) $30 \div (-4)$

4. Calculate :-

(a) $(-3) \times (-4)$ (b) $(-5) \times (-5)$ (c) $(-7) \times (-2)$ (d) $(-7) \times (-12)$

(e) $(-15) \times (-4)$ (f) $(-8) \times (-12)$ (g) $(-50) \times (-20)$ (h) $(-100) \times (-30)$

(i) $(-6) \div (-2)$ (j) $(-9) \div (-3)$ (k) $(-16) \div (-4)$ (l) $(-1000) \div (-50)$

(m) $(-64) \div (-16)$ (n) $(-600) \div (-50)$ (o) $(-22) \div (-4)$ (p) $(-41) \div (-4)$

5. Find :-

(a) $(3 \times (-6)) \div 2$ (b) $((-3) \times (-4)) \div 6$ (c) $((-6) \times (-4)) \div 12$ (d) $((-4) + (-6)) \div 2$

(e) $(5 - (-5)) \times 4$ (f) $((-6) + (-6)) \div 4$ (g) $(-8) \times (4 - 6)$ (h) $((-3) - (-9)) \div (-2)$

(i) $(-3) \times (-4) \times (-5)$ (j) $6 \times (-2) \times (-4)$ (k) $8 \times (-2) \div (-1)$ (l) $(-2)^3$

(m) $(-4)^3$ (n) $(-2)^2 + (-1)^2$ (o) $(-5)^3 + (-3)^4$ (p) $(-2)^5 - (-2)^3$

Revision Exercise

1. (a) Isa has £42 in her bank account. She withdraws £60. What will her balance be ?
   (b) Billy has a balance of (-£44). He withdraws £28. How much is Billy now overdrawn ?
   (c) Carol has a balance of (-£123). She deposits £65.
   How much will she now have to deposit to clear her overdraft ?

2. (a) Jamus III was born in 12 B.C. and died in 33 A.D.
   How old was Jamus III when he died ?
   (b) Emperor Hirto-Sito died at the age of sixty seven in 45 A.D.
   What year was he born ?

3. The afternoon temperature on a mountain top is recorded at 4°C.
   The temperature drops by 16°C at night.
   What is the night-time temperature ?

4. A liquid is at a temperature of 25°C. Its freezing point is -18°C.
   How many degrees will the temperature have to drop to freeze the liquid ?

5. Find :-

(a)	4 + (-2)	(b)	6 + (-8)	(c)	11 + (-20)	(d)	-3 + (-2)
(e)	-1 + 7	(f)	-45 + (-33)	(g)	16 + (-19)	(h)	4 - (-2)
(i)	5 - (-11)	(j)	-6 - (-5)	(k)	3 x (-2)	(l)	5 x (-5)
(m)	(-8) x 4	(n)	(-6) x (-5)	(o)	(-12) x (-10)	(p)	(-14) ÷ 2
(q)	(-36) ÷ 4	(r)	8 ÷ (-2)	(s)	(-60) ÷ (-12)	(t)	(-150) ÷ (-25)

6. Calculate :-

(a)	(12 + (-3)) x 2	(b)	((-14) - (-6)) ÷ 2	(c)	8 x (4 - (-5)) ÷ 3

7. Simplify :-

(a)	$4a + (-2a)$	(b)	$32g - (-12g)$	(c)	$-5z - (-5z)$
(d)	$6b + 2c + (-5b) - (-c)$	(e)	$7h + (-3k) - 2k - (-h)$	(f)	$x + (-1)^2 + (-x) + (-1)^7$

Scientific Notation

Exercise 11

1. Copy and complete the following :-

   39 000 = 3900 x 10 = 390 x .... x .... = 39 x .... x .... x ....

   = 3·9 x ..... (Stop here, since 3·9 lies between 1 and 10).

   = 3·9 x $10^{\cdots}$

2. Using the same method as Qu 1., write the following numbers in scientific notation :-

   (a) 4800 (b) 6780 (c) 31 000

   (d) 35 200 (e) 54 350 (f) 970 000

   (g) 487 000 (h) 109 100 (i) 4 400 000.

Exercise 12

1. Using the "quick" method, write the following numbers in scientific notation :-

   (a) 49 000 (b) 547 000 (c) 234 000

   (d) 660 (e) 1482 (f) 9000

   (g) 70 000 (h) 1 680 000 (i) 47 300 000.

2. You have learned that :- 3 million = 3 000 000 = $3{\cdot}0 \times 10^6$

   1·27 million = 1 270 000 = $1{\cdot}27 \times 10^6$

Write out each of the following in full, then write each in scientific notation :-

(a) 7 million = 7 000 000 = $7{\cdot}0 \times 10^{\cdots}$

(b) 2·5 million (c) 9·19 million (d) $4\frac{1}{2}$ million

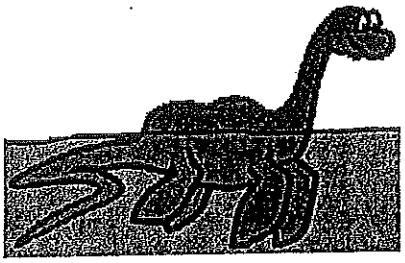
(e) 17 million (f) 27 million (g) 2·8 million

(h) 1·97 million (i) $12\frac{1}{2}$ million (j) $15\frac{1}{2}$ million

(k) 5·714 million (l) $5\frac{1}{4}$ million (m) $6\frac{3}{4}$ million.

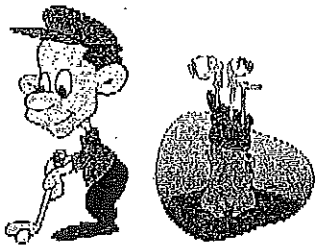
3. This table gives the areas of various stretches of water throughout the world.
Write each of the areas in scientific notation.

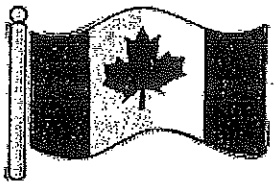
Sea / Ocean	*Area (km^2)*
Pacific Ocean	165 380 000
Atlantic Ocean	82 ·21 million
Indian Ocean	73·6 million
Mediterranean	2 510 000
River Clyde	2 130
Loch Ness	56
English Channel	103 600



Nessie ?

4. A golf caddie earns £250 000 per annum.
Write his earnings in scientific notation.



5. 

The population of Canada in May 2004 was 31 million and 629 thousand.
Write this number in scientific notation.

Exercise 13

1. Change each of the following from scientific notation to number form :-

(a) $3{\cdot}8 \times 10^4$ (b) $7{\cdot}5 \times 10^2$ (c) $3{\cdot}24 \times 10^5$ (d) $6{\cdot}47 \times 10^3$

(e) $1{\cdot}478 \times 10^4$ (f) 3×10^1 (g) 9×10^6 (h) $2{\cdot}9 \times 10^6$

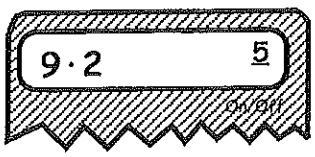
(i) $6{\cdot}014 \times 10^4$ (j) 7×10^7 (k) $5{\cdot}37 \times 10^7$ (l) $8{\cdot}888 \times 10^8$.

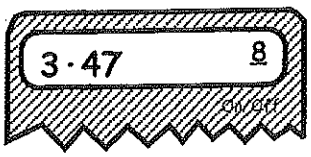
2.

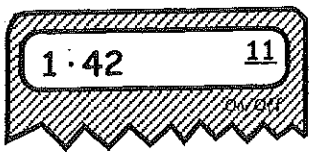
Player	*Valuation*
Figo	£$1{\cdot}525 \times 10^7$
Woodgate	£$5{\cdot}75 \times 10^6$
Novo	£$8{\cdot}755 \times 10^5$
Coyle	£$3{\cdot}285 \times 10^4$
McCracken	£$1{\cdot}004 \times 10^2$

This table shows the valuation of certain football players as of June 2004.
Write out each of the valuations in full.

3. What large numbers are shown on the calculators below ?

(a) 

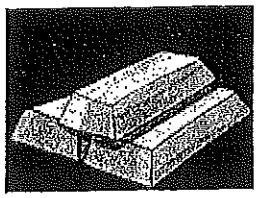
(b) 

(c) 

4. Write the amount, £1 billion :-

(a) as a very large number in figures.

(b) in scientific notation.



Exercise 14

1. Write the following small numbers in scientific notation :-

(a) 0·003 (b) 0·000 074 (c) 0·0286 (d) 0·000 006

(e) 0·000 482 (f) 0·287 (g) 0·003 93 (h) 0·000 07.

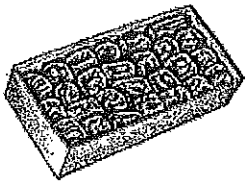
2. Write the following numbers in full :-

(a) $5{\cdot}1 \times 10^{-2}$ (b) $3{\cdot}6 \times 10^{-4}$ (c) $2{\cdot}74 \times 10^{-3}$ (d) $5{\cdot}06 \times 10^{-5}$

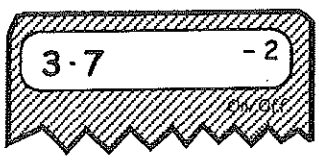
(e) $3{\cdot}2741 \times 10^{-1}$ (f) 4×10^{-3} (g) 7×10^{-5} (h) $8{\cdot}009 \times 10^{-6}$.

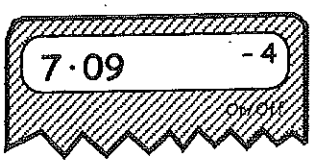
3. A box of toffees weighs $5{\cdot}81 \times 10^{-2}$ kilograms.

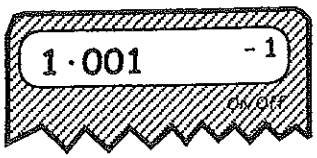
Is this more or less than 58 grams ?



4. What small numbers are shown on the calculators below ?

(a) 

(b) 

(c) 

5. Write out in full :-

(a) $4{\cdot}2 \times 10^{-2}$ (b) $7{\cdot}8 \times 10^{6}$ (b) $8{\cdot}01 \times 10^{-4}$ (d) $9{\cdot}021 \times 10^{3}$.

6. Write in scientific notation :-

(a) 0·003 (b) 5470 (c) 0·000 39 (d) 21 500 000.

Revision Exercise

1. Write the following numbers in scientific notation :-

   (a) 400 (b) 8000 (c) 16500

   (d) 5 million (e) 1·89 million (f) $3\frac{1}{4}$ million

   (g) 70000 (h) 1680000 (i) 47300000.

2. Change each of the following from scientific notation to number form :-

   (a) $2{\cdot}4 \times 10^4$ (b) $6{\cdot}2 \times 10^2$ (c) $7{\cdot}361 \times 10^5$ (d) 9×10^7.

3. Write the amount TWO BILLION POUNDS :-

   (a) as a very large number in figures.

   (b) in scientific notation.

4. Write the following small numbers in scientific notation :-

   (a) 0·05 (b) 0·000092 (c) 0·0274 (d) 0·000002

   (e) 0·000175 (f) 0·368 (g) 0·00181 (h) 0·00009.

5. Write the following numbers in full :-

   (a) $3{\cdot}9 \times 10^{-2}$ (b) $2{\cdot}1 \times 10^{-4}$ (c) $4{\cdot}97 \times 10^{-3}$ (d) $7{\cdot}02 \times 10^{-5}$

   (e) $3{\cdot}2748 \times 10^{-1}$ (f) 5×10^{-3} (g) 9×10^{-5} (h) $3{\cdot}007 \times 10^{-6}$.

SPOTLIGHT ON

Scientific Notation

Exercise 15

1. Find the value of each of the following when $a = 1$, $b = 2$, $c = 3$ and $d = 4$:-

(a) $2a$ (b) $4c$ (c) $2d + 1$ (d) $a + b + c + d$

(e) $2a + 3c$ (f) $5b - 2d$ (g) $3a + 2b + c - 2d$ (h) $ab + cd$

(i) $4ab + d - 2abc$ (j) $(a + c)^2$ (k) $a^2 + b^2 + c^2$ (l) $(a + b - c)^2$

(m) $(c - d)^3$ (n) $\sqrt{(c^2 + d^2}$ (o) $2abc \div d$ (p) $a + d(bc - ab)$.

2. Find the value of each of the following when $e = -1$, $f = 3$, $g = -2$ and $h = 2$:-

(a) $5e + f$ (b) $3f + 2g - h$ (c) $3e + 2f - 3g$ (d) $ef + gh$

(e) $2fg + e^3$ (f) $(eh - gf)^2$ (g) $e^2 - h^2 - g^2 + f^2$ (h) $3(2e + f) + 2h^2$

(i) $\frac{1}{2}(h + e)^2$ (j) $2efgh$ (k) $e^2(f^2 - h^2)$ (l) $fg(3e - 5g) \div eh$.

Exercise 5

1. Copy and factorise :-

(a) $3a + 6 = 3(\ldots + \ldots)$ (b) $8g - 20 = 4(\ldots - \ldots)$ (c) $10y + 25x = 5(\ldots + \ldots)$

(d) $ab + 4a = a(\ldots + \ldots)$ (e) $2kg + 2kp = 2k(.. + ..)$ (f) $6b + 9b^2 = 3b(\ldots + \ldots)$.

2. Factorise :-

(a) $2a + 4$ (b) $3x + 12$ (c) $5k - 40$ (d) $6p + 6q$

(e) $12x + 15$ (f) $16y + 24$ (g) $24k - 15$ (h) $9a + 21b$

(i) $3x + 9y + 6$ (j) $4d + 6e + 10f$ (k) $12w + 30h - 18$ (l) $15q - 45p + 75m$.

3. Factorise fully :-

(a) $3ab + 21b$ (b) $12cd + 15c$ (c) $30pqr - 24pq$

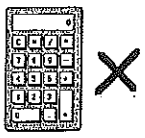
(d) $5x - 15xy + xz$ (e) $x^2 + 4x$ (f) $3y^2 + 6y$

(g) $8x^2 + 4x$ (h) $12y - y^2$ (i) $x^2 + x$

(j) $12x^2 + 4x$ (k) $x^3 + x$ (l) $y^3 + y^2 + y$.

Topic 2

Decimals



Calculators should not be used anywhere in this Chapter unless you are otherwise instructed.

Exercise 1

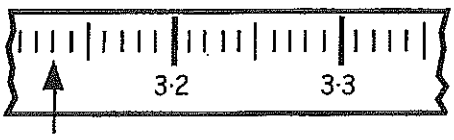
1. What does the 9 stand for in each of the following numbers :-

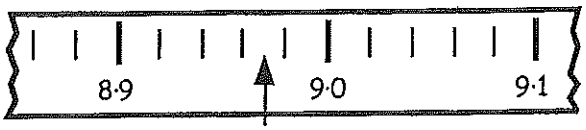
   (a) 291·743 (b) 1·094 (c) 0·954 (d) 3·019 ?

2. What is the number that is $\frac{9}{100}$ **down** from 4·15 ?

3. What number lies **half way** between 0·4 and 0·32 ?

4. To which numbers are each of the following arrows pointing :-

   (a) 

   (b) 

5. Round these numbers to 1 decimal place :-

   (a) 6·472 (b) 8·417 (c) 25·496 (d) 27·95.

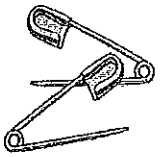
6. Bobby weighs 71·64 kilograms and Thomasina weighs 65·89 kilograms.

   (a) What is their combined weight ?

   (b) By how much is Bobby heavier than Thomasina ?

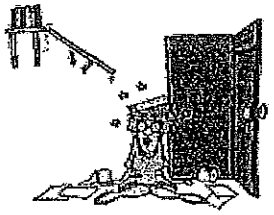
7. (a) When 1000 safety pins are weighed, their total weight is 34·8 grams.

   What is the weight of 1 safety pin ?



   (b) One hundred identical books are placed along a shelf. Each book is 3·4 cm thick.

   What is the minimum length of shelving required to stock the books ?

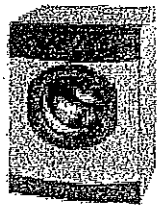


8. Set down and find :-

   (a) 5·9 x 6 (b) 17·2 x 7 (c) 4·86 x 8 (d) 14·39 x 9

   (e) 17·4 ÷ 6 (f) 123·2 ÷ 7 (g) 367·2 ÷ 8 (h) 316·8 ÷ 9.

* You may use a CALCULATOR in the next question

9. 

Mrs Chalmers paid a deposit of £43 when she bought a tumble drier priced £457.

She then had to pay the remainder by making 24 equal monthly instalments.

How much had she to pay per month ?

Exercise 2

1. Show all your working for the following (remember - NO calculator) :-

(a) 27·65 + 38·97 (b) 34·1 - 9·475 (c) 15 + 8·74 + 0·087

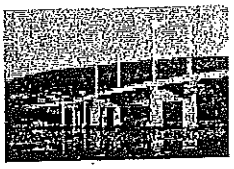
(d) 8·1 - 2·47 + 6·883 (e) 6 + 2·473 - 8·399 (f) 5·1 - 3·09 - 1·986

(g) 53·2 - 9·68 + 35·9 (h) 54·57 + 6·274 - 12·558 (i) 30·1 - 9·749 - 6·08

2. Mrs Galbraith bought 3 steaks at the butcher's. Their total weight was 7·85 pounds.

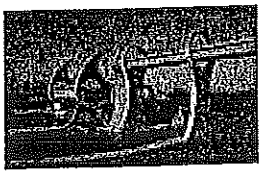
If the large steaks weighed 2·93 pounds and 3·34 pounds, find the weight of the smallest steak.

3. On Feb. 29th 2004, the temperature at noon in Inverness was -14·6°C. On the same day, further south in Falkirk the temperature at noon was -6·9°C.



(a) What was the difference in temperature at noon between both places ?

By 4 pm that day, the temperature in Inverness had risen by 4·7 degrees, whereas in Falkirk the temperature had fallen by 0·8 degrees.



(b) What was the difference in temperature at 4 pm between Inverness and Falkirk ?

4. COPY the following and fill in the correct numbers to replace the squares :-

(a)
$$\begin{array}{r} 7\cdot1\square\square \\ +\ \square\cdot\square 82 \\ \hline 9\cdot170 \end{array}$$

(b)
$$\begin{array}{r} 8\cdot\square1\square \\ -\ \square\cdot2\square7 \\ \hline 3\cdot096 \end{array}$$

(c)
$$\begin{array}{r} \square\cdot27\square \\ 3\cdot\square84 \\ +\ 6\cdot6\square9 \\ \hline \square2\cdot576 \end{array}$$

5. Have a go at these :-

(a) (-1·7) + 7·9 (b) (-1·8) + 1·9 (c) (-3·3) - 3·3

(d) 7·4 + 2·79 - 9 (e) (-5·68) + 7·255 (f) (-9·1) + 9·032

(g) 9·6 + 1·7 - 11 (h) (-3·25) + 7·55 - 6·15 (i) 4·85 - (-2·15)

(j) 9·37 - (-2·46) (k) (-3·18) + (-0·77) (l) (-4·06) - (-3·2)

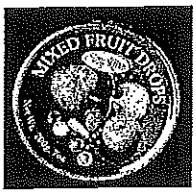
Exercise 3

1. Write down the answers to :-

(a) $6 \times 0{\cdot}3$ (b) $8 \times 0{\cdot}9$ (c) $15 \times 0{\cdot}4$ (d) $0{\cdot}6 \times 250$

(e) $60 \times 0{\cdot}5$ (f) $0{\cdot}9 \times 90$ (g) $0{\cdot}9 \times 600$ (h) $7000 \times 0{\cdot}3$.

2. A tin of mixed fruit drops weighs 6·2 ounces.



What would the following weigh :-

(a) 1000 tins (b) 40 tins

(c) 700 tins (d) 3000 tins ?

3. 

A bag of jell-beans costs £0·46.

What is the cost of :-

(a) 8 bags (b) 70 bags

(c) 400 bags (d) 5000 bags ?

4. Find :-

(a) $6 \times (-0{\cdot}8)$ (b) $8 \times (-0{\cdot}8)$ (c) $0{\cdot}6 \times (-3)$ (d) $0{\cdot}7 \times (-8)$

(e) $15 \times (-0{\cdot}4)$ (f) $(-25) \times (-0{\cdot}9)$ (g) $(-0{\cdot}5) \times (-120)$ (h) $(-0{\cdot}7) \times (-90)$.

Exercise 4

1. Calculate :-

(a) $4{\cdot}6 \div 2$ (b) $7{\cdot}5 \div 5$ (c) $4{\cdot}8 \div 8$ (d) $7{\cdot}2 \div 9$

(e) $18 \div 30$ (f) $42 \div 60$ (g) $64 \div 80$ (h) $45 \div 90$

(i) $540 \div 600$ (j) $350 \div 500$ (k) $630 \div 900$ (l) $490 \div 700$

(m) $1{\cdot}1 \div 1000$ (n) $4{\cdot}8 \div 3000$ (o) $9{\cdot}5 \div 5000$ (p) $6{\cdot}3 \div 7000$.

2. When 600 carpet tacks are weighed, their total weight is 138 grams.

What is the weight of 1 carpet tack ?

3. A hare ran 1·36 kilometres in 8 minutes.

How far had it travelled, on average, each minute ?

4. Find :-

(a) $(-7{\cdot}4) \div 2$ (b) $6{\cdot}5 \div (-5)$ (c) $7{\cdot}2 \div (-8)$ (d) $(-6{\cdot}3) \div 9$

(e) $28 \div (-40)$ (f) $72 \div (-90)$ (g) $(-54) \div 60$ (h) $(-2{\cdot}8) \div (-700)$.

Exercise 5

1. Calculate :-

(a) $0{\cdot}8 \times 6$ (b) $0{\cdot}8 \times 60$ (c) $0{\cdot}8 \times 600$ (d) $0{\cdot}8 \times 6000$

(e) $0{\cdot}8 \times 0{\cdot}6$ (f) $0{\cdot}08 \times 0{\cdot}6$ (g) $0{\cdot}008 \times 0{\cdot}6$ (h) $0{\cdot}0008 \times 0{\cdot}6$

(i) $(0{\cdot}7)^2$ (j) $0{\cdot}09 \times 0{\cdot}3$ (k) $0{\cdot}03 \times 0{\cdot}3$ (l) $0{\cdot}006 \times 0{\cdot}7$

(m) $0{\cdot}08 \times 30\,000$ (n) $400 \times 0{\cdot}0005$ (o) $0{\cdot}3 \times 0{\cdot}4 \times 0{\cdot}5$ (p) $20 \times 0{\cdot}8 \times 0{\cdot}6$

(q) $60 \times 0{\cdot}1 \times 700$ (r) $0{\cdot}8 \times 50 \times 0{\cdot}8$ (s) $0{\cdot}7 \times 500 \times 0{\cdot}3$ (t) $0{\cdot}6 \times 5000 \times 0{\cdot}4$.

2. Claire buys 400 bubble gums at £0·07 each. What does this cost her ?

3. One evening last winter, 3 centimetres of snow fell every hour.
What depth of snow fell during the 15 minutes it was snowing ?

4. Try these trickier examples :-

(a) $0{\cdot}03 \times 0{\cdot}03$ (b) $0{\cdot}06 \times 0{\cdot}07$ (c) $0{\cdot}08 \times 0{\cdot}09$ (d) $0{\cdot}05 \times 0{\cdot}04$

(e) $(-0{\cdot}8) \times 0{\cdot}7$ (f) $0{\cdot}02 \times (-0{\cdot}04)$ (g) $(-0{\cdot}08) \times (-0{\cdot}01)$ (h) $0{\cdot}009 \times 0{\cdot}003$.

Exercise 6

1. Find :-

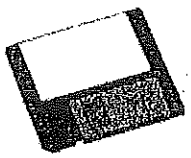
(a) $6 \div 0{\cdot}3$ (b) $36 \div 0{\cdot}9$ (c) $100 \div 0{\cdot}4$ (d) $2{\cdot}4 \div 0{\cdot}8$

(e) $4{\cdot}55 \div 0{\cdot}5$ (f) $22{\cdot}33 \div 0{\cdot}7$ (g) $6 \div 0{\cdot}03$ (h) $5{\cdot}2 \div 0{\cdot}04$

(i) $0{\cdot}54 \div 0{\cdot}006$ (j) $0{\cdot}045 \div 0{\cdot}009$ (k) $0{\cdot}0174 \div 0{\cdot}003$ (l) $12 \div 20$

(m) $45 \div 500$ (n) $56 \div 7000$ (o) $720 \div 8000$ (p) $350 \div 5000$.

2. 3000 floppy disks can store 4710 megabytes.
How many megabytes can be stored on one such disk ?



3. A small tub holds 0·08 litres of pineapple yogurt.
How many tubs can be filled from a container which contains :-

(a) 3·2 litres (b) 16 litres (c) 40 litres (d) 0·64 litres ?

4. A box of 3000 Xmas cards weighs 4·2 kg, not including the weight of the box itself.
Work out the weight of one card, (a) in kg's. (b) in grams.

5. Have a go at these :-

(a) $20 \div 0{\cdot}0004$ (b) $(-0{\cdot}54) \div 0{\cdot}3$ (c) $(-0{\cdot}72) \div (-0{\cdot}8)$ (d) $(-0{\cdot}007) \div (-0{\cdot}07)$.

Exercise 7

1. Round these numbers to the number of decimal places shown in the brackets :-

   (a) 5·13 (1) (b) 7·851 (1) (c) 8·736 (2) (d) 6·3492 (2)

   (e) 4·8912 (3) (f) 3·2915 (3) (g) 47·999 24 (3) (h) 3·999 88 (3).

2. Use your calculator to do the following and give your answer correct to 2 decimal places :-

   (a) 4·36 + 6·447 (b) 23·82 x 16·35 (c) 37·1 ÷ 68·3 (d) 16 ÷ 7.

3. Do these calculations and round your answer to the number of decimal places shown in the brackets :-

   (a) 2·58 x 0·247 (3) (b) 0·394 x 6·555 (2) (c) 6·274 x 1·983 (3)

   (d) 0·58 ÷ 3·267 (3) (e) 16·27 ÷ 19·443 (1) (f) 0·7 x 0·19 x 0·87 (4).

4. (a) Nine people share £14. How much does each receive ?

   (b) Share £27·98 amongst 3 people.
   What is the maximum amount each person can receive ?

Exercise 8

1. How many **significant figures** does each number have in the following context :-

   (a) There are **700** pennies in £7.

   (b) The cost of a soft toy is exactly **£7·50**.

   (c) There are **180°** in a half-turn.

   (d) The volume of a small bottle of juice is **200** ml, correct to the nearest 100 ml.

2. How many significant figures are there in each of these numbers :-

   (a) 62·0 (b) 3·00 (c) 1·009 (d) 40·7

   (e) 26·30 (f) 0·741 (g) 0·027 (h) 0·000 90 ?

3. Round each number to 1 significant figure :-

   (a) 53 (b) 2679 (c) 0·251 (d) 0·000 815.

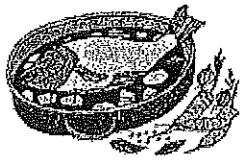
4. Round each number to 2 significant figures :-

   (a) 308 (b) 5229 (c) 48·55 (d) 0·003 281.

5. Round each number to 3 significant figures :-

   (a) 9812 (b) 72 091 (c) 0·287 45 (d) 0·019 999.

6. What is the total volume, (in ml), of 25 bottles of juice, each containing 675 ml ?
(Give your answer in millilitres to 3 significant figures)

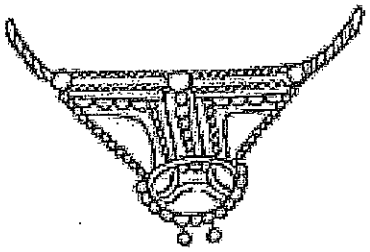
7. 

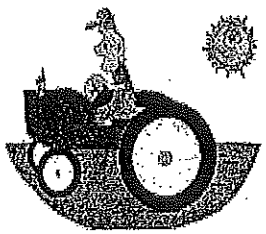
Harriet's restaurant bill came to £86·33 + VAT at 17·5%.
Calculate the VAT in £'s, correct to 4 sig. fig.

8. A jar of jam weighs 0·345 kg.
Round the weight to 2 sig. figs. and **estimate** the total weight of 200 jars.

Exercise 9 

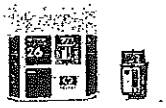
1. Mrs Binnie bought a silver chain for £265·90 and a necklace for £85·75.
One year later she sold the chain for £305 and the necklace for £102.
How much of a profit did she make altogether ?



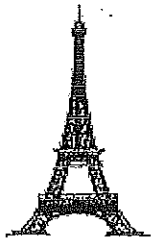
2. 

A farmer bought a tractor priced at £15 840.
He took out a Hire Purchase agreement.
He paid a deposit of £790, and followed this by making 48 monthly payments of £358·10.
(a) How much did it cost altogether for the tractor using H.P. ?
(b) How much more was this than the advertised price ?

3. Madge sells printer cartridges, earning an **annual** salary of £13 837·20. Calculate Madge's weekly wage.



4. Jaki is a make-up consultant and is paid £12·48 per hour.
Last week she worked a total of 5 hours overtime at <u>time and a half</u>.
(a) Calculate Jaki's overtime hourly rate of pay.
(b) Calculate how much she earned altogether for her 5 hours overtime.

5. 

I returned with 50·05 euros from my holiday in Paris.
How many £'s will I receive for them with the exchange rate at 1·54 euros to the £ ?

Revision Exercise

(NO calculator except in question 10)

1. What is the number that is $\frac{7}{100}$ up from 3·26 ?

2. Round these numbers to 1 decimal place :-

   (a) 3·27 (b) 9·318 (c) 27·386 (d) 0·255 (e) 66·95.

3. Charlie weighs 72·38 kilograms and Joseph weighs 69·98 kilograms.

   (a) What is their combined weight ?

   (b) By how much is Joseph lighter than Charlie ?

4. Set down and find :-

   (a) 6·8 x 9 (b) 25·7 x 8 (c) 5·32 ÷ 7 (d) 25·62 ÷ 6

   (e) 15 x (-0·6) (f) (-25) x (-0·8) (g) (-0·3) x (-120) (h) (-0·4) x (-90)

   (i) 450 ÷ 500 (j) 56 ÷ 70 (k) 7·5 ÷ 5000 (l) 36 ÷ (-90).

5. Mr Thom bought 3 salmon at the fish shop. Their total weight was 8·23 pounds.

   If the large fish weighed 2·98 pounds and 3·47 pounds, find the weight of the smallest fish.

6. Find :-

   (a) (-2·38) + 9·17 - 4·46 (b) (-1·08) - (-5·02).

7. Calculate :-

   (a) 0·7 x 9 (b) 0·4 x 80 (c) 0·07 x 0·4 (d) 0·6 x 500 x 0·4

   (e) 8 ÷ 0·4 (f) 0·063 ÷ 0·009 (g) 0·0192 ÷ 0·003 (h) 180 ÷ 200.

8. Round these numbers to the number of decimal places shown in the brackets :-

   (a) 7·29 (1) (b) 4·535 (2) (c) 6·2874 (3) (d) 57·998 54 (3).

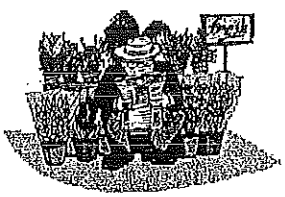
9. Round these numbers to the number of significant figures shown in the brackets :-

   (a) 3210 (1) (b) 45830 (2) (c) 128·057 (3) (d) 0·0002471 (2).

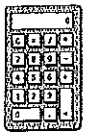
10. Jim is a florist and is paid a rate of £10·75 per hour. Last week he worked a total of 35 normal hours PLUS 6 hours overtime at <u>time and a half</u>.

    (a) Calculate how much Jim earned for his 6 hours overtime.

    (b) Calculate how much he earned <u>altogether</u> for his 6 hours overtime AND his 35 hours at £10·75.



Chapter 19



Calculators may be used from Exercise 2 onwards

Percentages

Exercise 1

1. Write the following percentages as FRACTIONS (simplify where possible) :-

   (a) 50% (b) 25% (c) 75% (d) $33\frac{1}{3}\%$ (e) $66\frac{2}{3}\%$

   (f) 10% (g) 20% (h) 70% (i) 80% (j) 90%.

2. Find the following (remember - no calculator) :-

   (a) 10% of £34 (b) 70% of £20 (c) 20% of £6·50

   (d) 80% of 20p (e) 25% of £4200 (f) $33\frac{1}{3}\%$ of £18

   (g) 5% of £7·20 (h) 1% of £9 (i) 2·5% of £6.

3. Write each of the following as a fraction AND as a decimal :-

   (a) 36% (b) 45% (c) 8% (d) 11% (e) 12·5%.

4. Write these percentages as fractions and simplify :-

   (a) 15% (b) 30% (c) 4% (d) 96% (e) 22%.

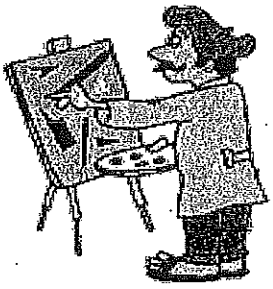
5. Change these marks to percentages :-

   (a) Geography 32 out of 40.

   (b) Art 9 out of 50.

   (c) Physics 60 out of 80.

   (d) Mental Maths 1 out of 10.



Q 5, 6 & 7

6. Find :-

   (a) 7% of £52 (b) 6% of £520 (c) $17\frac{1}{2}\%$ of £12.

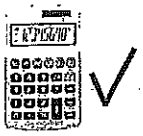
7. The price of colour printers has fallen again this week by 12·5%.

   What is the up to date price of the printer shown.

Last week £104·00

Now

Exercise 2

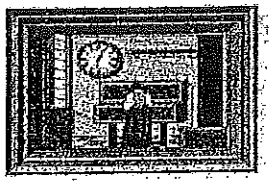


1. Fares on the Subway Trains are expected to rise soon by 8%.
   What will be the new cost of a ticket which just now is priced £1·25 ?

2. In a sale, a polo shirt, normally priced at £25·50, is reduced by 30%.
   What is the sale price of the shirt ?

3. (a) Increase £70 by 3%. (b) Decrease £620 by 4·5%.
   (c) Increase £1220 by 17·5%. (d) Decrease £80 000 by 7·25%.

4. A petrol lawn mower bought for £180 in 2001 has depreciated in value over the past few years.
   It is now worth 84% **less** than its original value.
   What is the mower worth today ?

5. 

   A unique painting was purchased in 2002 for £30 000.
   Since then its value has risen by 20% each year.
   If this trend continues, what is the first year in which the painting will be worth at least double its original value ?

6. Mildred borrows £2500 from a Finance Company.
   They add on interest of 12% in the first month, 20% in 2nd month and 25% in the third month.
   Including the amount she borrowed, how much will Mildred owe after 3 months ?

Exercise 3

1. Express £20 as a percentage of :-
   (a) £80 (b) £50 (c) £1000 (d) £4000.

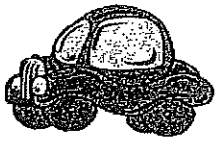
2. Express :-
   (a) £39 as a percentage of £78 (b) £40 as a percentage of £120
   (c) £2·60 as a percentage of £40 (d) 90p as a percentage of £7·20.

3. From a monthly wage of £1450, I pay £94·25 in council tax.
   What percentage of my wage goes on council tax ?

4. 

The local paper girl got paid £15·25 per week last year.
This year her pay has risen to £17·99.
What percentage pay rise did she receive ? (to 1 decimal place)

5. A car bought new for £9280 was worth only £3300 a few years later.
Calculate the depreciation, and express it as a percentage of the cost when new. (*Round to nearest whole %*)



6. 

A rare vase bought for £80 some years ago has now been valued at £440 !
Calculate the appreciation as a percentage of the buying price.

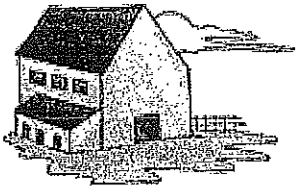
Exercise 4

1. After a 20% pay rise Donald's wage for his part-time job rose to £72.
Calculate Donald's wage before his pay rise.

2. 

A jumper's price is reduced by 15%. It was on sale for £68.
What was the original price of the jumper ?

3. McGyll's Bus Company increased all of its ticket prices by 4%.
What was the original cost for a bus ticket which now costs £1·30 ?

4. 

A detached villa has appreciated in value by 14·5%.
It is now valued at £148 850.
Calculate the original value of the villa.

5. The Gardening Store has a sale on.
Calculate the original prices of these goods.

(a)

CONIFERS
17·5% OFF
Now £4·95

(b)

GARDEN FURNITURE
35% OFF
Now £299

Revision Exercise

No calculator to be used in questions 1 and 2.

1. Write each of the following as a fraction in its simplest form and also as a decimal :-

   (a) 30% (b) $33\frac{1}{3}\%$ (c) 48% (d) 7% (e) 87·5%.

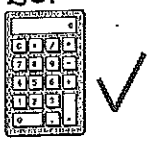
2. Find the following (remember, no calculator) :-

   (a) 50% of £54 (b) 30% of £70 (c) 25% of £8·40

   (d) 60% of 50p (e) 10% of £3800 (f) $33\frac{1}{3}\%$ of £21

   (g) 5% of £3·20 (h) 2% of £6 (i) 12·5% of £8.

You may use a calculator for the remainder of this exercise



3. I got 48 out of 60 in my maths ink exercise. What was my percentage mark ?

4. In a sale, a jacket, normally priced at £40·50, is reduced by 18%.

   What is the sale price of the jacket ?

5. Express :-

   (a) £46 as a percentage of £92 (b) £30 as a percentage of £90

   (c) £2·40 as a percentage of £30 (d) 96p as a percentage of £1·20.

6. 

   Danny's hourly rate last year was £12·56.

   This year, his hourly rate has risen to £14·13.

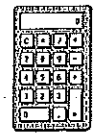
   What percentage pay rise did he receive ?

7. A lawn mower's price was reduced by 25% in a sale.
   I bought one in the sale for £90.

   What was the cost of a lawn mower before the sale ?

Topic 3

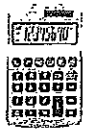
Chapter 17



Calculators may be used in this Chapter

Statistics

Exercise 1



1. Calculate the **mean** for each set of data :-

   (a) 3, 8, 4, 2, 10, 7, 8

   (b) 50, 60, 52, 58, 54, 56

   (c) 1·3, 2·6, 3·2, 4·1, 5, 4·8, 4, 1·9, 0·1, 2

   (d) the first ten prime numbers.

2. Find the **median** for each set of data :-

   (a) 1, 3, 5, 6, 8, 11, 14

   (b) 16, 22, 23, 25, 31, 40, 61, 63

   (c) 4, 1, 14, 12, 6, 7, 11, 13, 9

   (d) 5, 8, 21, 12, 5, 16, 33, 12, 15, 9.

3. Find the **mode** for each set of data :-

   (a) 1, 1, 2, 3, 5, 8, 13, 21, 34, 55

   (b) 3, 2, 1, 8, 4, 5, 9, 2, 7, 6, 0,

   (c) 1·7, 2·3, 1·6, 3, 2·3, 3·7, 2·9,

   (d) A, C, F, G, H, Y, T, E, D, D, G, H, G.

4. Find the **range** for each set of data in question 3(a) to (c).

5. Find the **mean, median, mode** and **range** of each set of data :-

   (a) 10, 14, 15, 15, 16, 19, 22, 23, 27, 29, 30

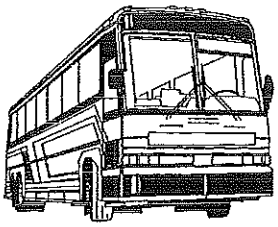
   (b) 46, 31, 66, 73, 83, 43, 16, 66

   (c) All the prime numbers between 30 and 50.

6. 

   The mean weight of 4 boxes is 300 kg.
   Three of the boxes each weigh 85 kg.
   What is the weight of the fourth box ?

7. The mean cost for 12 people to hire a bus was to be £15.
   Unfortunately, some people did not turn up for the bus trip.
   Each of those who went on the trip ended up paying £22·50.
   How many must have turned up ?

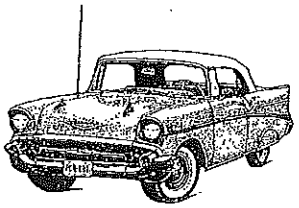


Exercise 2 ✓

1. The data below shows the number of cars parked on a main street each day at lunchtime.

16	11	32	40	65	32	33	18	12	6	23
57	16	54	42	67	32	78	47	49	52	70
16	38	7	13	35	79	71	52	24	15	10

Class Intervals	Tally	Frequency
0 - 9		
10 - 19	COPY	
20 - 29		
30 - 39		
40 -		

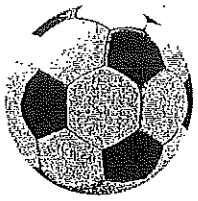


(a) COPY and complete the frequency table.

(b) On how many days was data collected ?

(c) On how many days were there more than 30 cars parked at lunchtime ?

2. Shown is the number of children attending football training each week.



22	3	5	17	24	17	4	11
10	18	8	26	19	19	23	9
13	23	13	22	26	9	23	15
2	18	17	15	26	11	19	10
12	10	19	11	14	6	7	20

(a) Which of these would be the most suitable class interval to use :-

(0 - 9) or (0 - 4) or (0 - 1) ?

(b) Construct a frequency table using your chosen class interval.

3. For each set of data below, choose a suitable class interval and construct a frequency table.

(a)

13	4	41	69	51	58	57	33
11	40	46	61	22	22	52	63
14	53	46	54	42	56	60	54
50	29	43	13	46	17	25	21
25	36	39	20	7	11	14	6

(b)

20	18	5	18	13	9	11	21
7	17	8	22	13	23	4	19
6	15	13	26	10	19	17	22
14	26	10	8	18	19	24	3
11	11	15	23	8	26	17	5

(c)

2·9	5·7	5·1	4·9	3·0	1·1	2·4	6·8	0·9	5·5	1·7	6·2
0·5	6·3	4·5	3·4	5·6	3·1	3·4	4·6	3·7	2·5	1·6	3·7
5·0	2·9	4·3	2·1	5·4	4·6	5·3	6·1	2·2	5·7	5·8	1·3

Exercise 3

1. A footballer practised taking 4 penalties every day. The table shows the results over several weeks.

   (a) COPY and complete the table.

   (b) How many days did he record taking penalties ?

   (c) How many penalties were scored in total ?

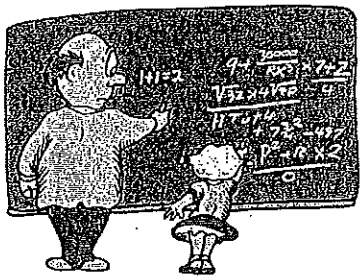
   (d) Calculate the mean number of penalties scored.

No. scored (x)	Freq (f)	$f \times x$
0	2	$0 \times 2 = 0$
1	2	$1 \times 2 = \ldots$
2	11	$2 \times \ldots = \ldots$
3	16	$\ldots \times \ldots = \ldots$
4	9	$\ldots \times \ldots = \ldots$
	...	...

2. Shown are the test scores for classes 2X1 and 2Y1.

2X1 scores (x)	Freq (f)
12	1
14	6
16	8
18	9
20	6

2Y1 scores (x)	Freq (f)
12	5
14	5
16	11
18	8
20	1

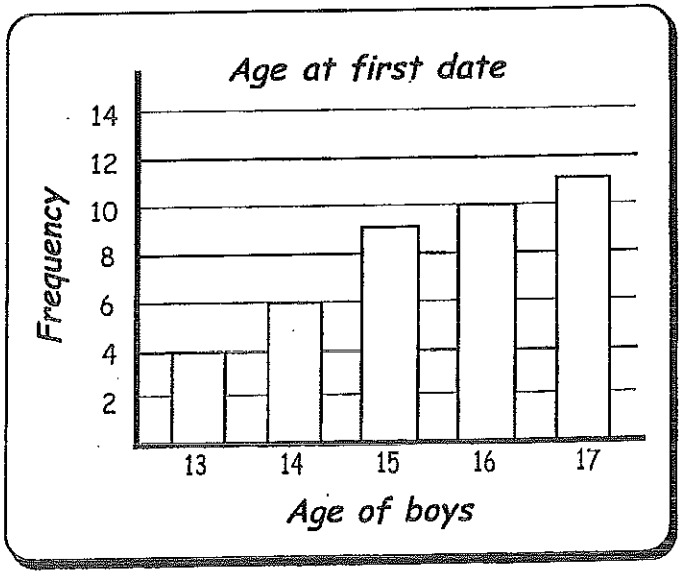


   (a) How many pupils are in each class ?

   (b) Find the mean score for each class.

   (c) Find the median score for each class .

3. A group of 18 year old boys were asked how old they were when they went out on their first "date". The results are shown in this bar graph.



   (a) Form a frequency table from the information in the bar graph.

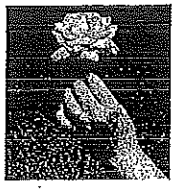
   (b) Calculate the : -

   (i) mode

   (ii) range

   (iii) mean

   (iv) median.



Exercise 4

1. A gardener recorded the number of **new** dandelions that appeared in his lawn each week over a 7 week period.

   He began to use a weed killer and studied the results.

   (a) Copy and complete the table.

   (b) Which week did the gardener start using the weedkiller ?

   (c) Find the median.

Week	Frequency (new weeds)	Cumulative freq. (total so far)
1	3	3
2	12	15
3	36	...
4	68	...
5	40	...
6	12	...
7	1	...

2. For each table below :-

   (i) add a cumulative frequency column (ii) find the median.

(a)

Goals	Frequency
0	1
1	4
2	12
3	11
4	8
5	6
6	0

(b)

Score	Frequency
0	2
1	3
2	5
3	15
4	18
5	6
6	2

(c)

No.	Frequency
10	3
11	3
12	12
13	16
14	15
15	24
16	35

Exercise 5

1. The table shows the results of a questionnaire asking a group of 90 pupils their favourite bedtime drink.

   (a) **COPY** and complete the table.

   (b) Construct an accurate pie chart using a pair of compasses, a protractor and the table information.

Drink	Number	Fraction	Angle
Water	10	$\frac{10}{90}$	$\frac{10}{90} \times 360 = 40°$
Chocolate	15	$\frac{15}{90}$	$\frac{15}{90} \times 360 = ...°$
Milk	30	$\frac{....}{90}$	$\frac{....}{90} \times 360 = ...°$
None	35	$\frac{....}{90}$	$\frac{....}{90} \times 360 = ...°$
TOTAL	90	1	360°



2. For each table below, construct an accurate pie chart, showing all your working.

(a)

Favourite pet	Number
Cat	20
Dog	10
Mouse	12
Rabbit	18
TOTAL	....

(b)

People's weight (kg)	Number
30 - 50	80
51 - 70	120
71 - 90	480
91 - 110	40
TOTAL	....

3. The table shows the results of a survey asking how old people were when they first went to the cinema.

9	8	6	7	5	6	9	5	6	5	5	6
5	9	7	6	9	7	6	9	9	6	5	5
5	6	7	6	8	6	8	7	6	6	8	6

Construct a **pie chart** to show this information.

Exercise 6

1. The stem and leaf diagram shows the ages of spectators watching a football match.

Spectators ages

1	2 2 6 9
2	0 4 5 6
3	0 1 1 1 2 4
4	2
5	0 3

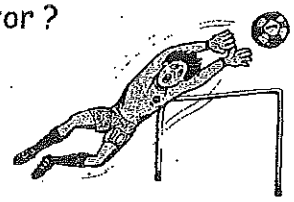
(a) Write a key for the diagram.

(b) Write out all the ages shown in the diagram.

(c) How old was the youngest spectator ?

(d) What was the modal age ?

(e) Find the median.



2. The unordered stem and leaf diagram shows the money donated to a local charity by a Primary seven class.

Money collected

1	1 7 4 0
2	9 1 3 4
3	9 8 2 3 2 2
4	0
5	3 0

(a) COPY the diagram, but put the donations in order.

(b) How many pupils donated money ?

(c) What was the largest donation ?

(d) What was the modal donation ?

(e) Find the average (mean) donation.

Key :

2 | 9 means £2·90

3. For each set of data shown :-

(i) Construct an ordered stem and leaf diagram. (ii) Find the mode and median.

(a) Ages of mature students at a University.

23	42	27	37	25	60	29	35	26	45	35	26
50	39	27	26	42	47	26	59	42	23	29	29
20	51	43	44	28	46	42	27	52	30	30	42

(b) Distances (in metres) jumped from a standing position.

1·62	1·23	1·41	1·15	0·97	1·31	1·23	1·26	1·5
1·33	1·29	1·12	1·23	1·19	1·36	1·53	1·08	1·23
0·9	1·2	1·51	1·03	1·66	1·53	1·44	1·23	1·39

Exercise 7

1. State whether each of the following statements is likely to have a positive correlation, a negative correlation or neither.

(a) The temperature in a park and the sales of ice-creams.

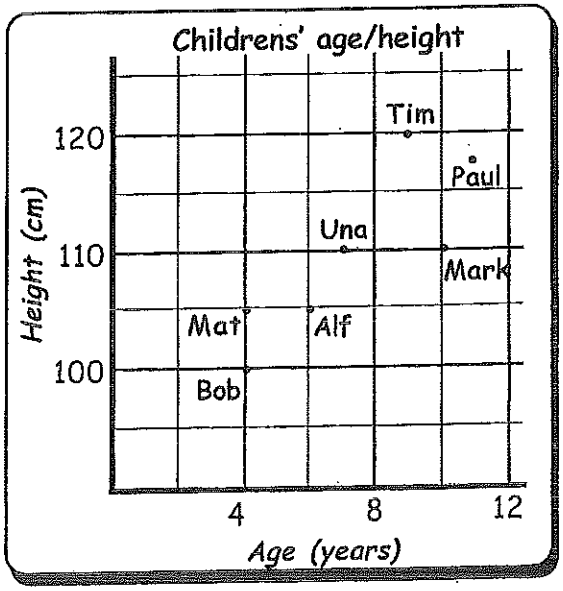
(b) The amount of sunshine and the sales of umbrella's.

(c) The distance travelled by an aeroplane and the cost of the flight.

(d) The number of chairs in a classroom and the number of teachers.

(e) The cost of a car and the mileage travelled by the car.

2. The scattergraph shows childrens' ages and heights (in cm).



(a) List the age and height of each person.

(b) State whether you think there is a positive correlation, a negative correlation or neither.

(c) Copy the scattergraph and draw a line of best fit.

(d) Use your line of best fit to estimate :-

(i) the height of Abby aged 9.

(ii) the age of Alex who is 125 cm tall.

3. For each data set, construct a scattergraph and draw a line of best fit :-

(a)

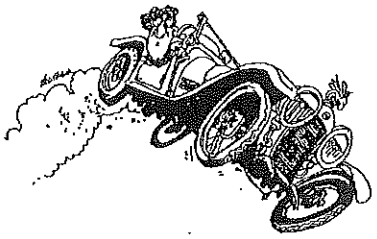
Engine size (1000cc)	1·1	1·1	1·1	1·4	1·4	1·4	1·6	1·6	1·6	1·8	1·8	1·8	2·0	2·0
km / litre	50	60	55	50	40	45	40	30	35	35	25	30	30	20

(b)

Age (years)	5	6	6	7	7	8	9	9	9	10	10	10	11	11	12	12	12	12
Javelin throw (m)	4	5	6	7	5	6	6	8	9	11	12	9	10	11	14	18	15	12

Exercise 8/9

1. State the likelihood of each statement :-



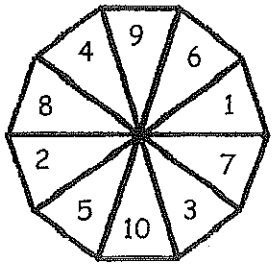
(a) All cars will be able to fly tomorrow.

(b) If today is Monday, tomorrow will be Tuesday.

(c) Toss a coin, it lands tails.

(d) We will play outside next week during the P.E. class.

2.

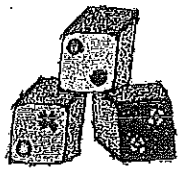


A ten sided dice numbered 1 to 10 is thrown.
Find :-

(a) P(even) (b) P(less than 3)

(c) P(prime) (d) P(square number).

3. A toy box contains building bricks.



There are 3 green, 1 black, 9 blue, 12 orange, and 15 white bricks.

Find :-

(a) P(green) (b) P(blue) (c) P(orange) (d) P(white)

(e) P(black) (f) P(not orange) (g) P(white or blue) (h) P(red).

4.

Paul and Peter each toss a coin and record the results.

Paul : H H T H T H H H T T H H T H T H T H H T T

Peter : H T H H T H H T T H T H ... ...

If the probability of heads to tails was the same for both boys, what were Peter's last two tosses ?

Exercise 10

1. A pupil wants to conduct a survey into extending school lunchtime by 30 minutes. State why the pupil, in his questionnaire, should **not** ask only :-

   (a) other pupils (b) local shops (c) local police.

2. Construct a short questionnaire to investigate the following :-

   (a) How much do prople spend on drinks every week ?

   (b) How many DVD's or videos do people buy each year ?

3. Describe the meaning of the words "**discrete**" and "**continuous**". Give an example of each.

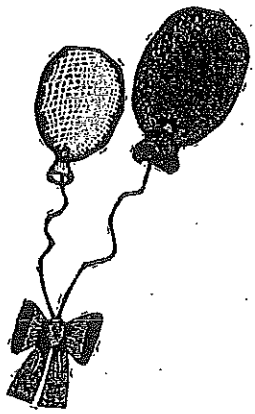
4. Conduct a survey of your choice using a sample (group) of 100 people in your data.

Revision Exercise

1. For each set of data, calculate the **mean**, **median**, **mode** and **range**.

   (a) 12, 12, 14, 16, 18, 20, 28, 32 (b) 3, 7, 1, 1, 4, 9, 10, 13

   (c) 3·6, 4·5, 5·4, 6·1, 7·3, 7·3 (d) 11·0, 13·7, 1·7, 8·4, 9·9, 13·7.



2. Tania had a birthday party at a local restaurant.

   The mean cost of the meal for the party of eight people was £18·20.

   Everyone agreed that Tania should not pay.

   How much will each person now need to pay ?

3. From the data shown, draw a frequency table using suitable class intervals.

2	15	12	26	0	16	11	9	1	19	23	23
25	17	22	21	2	20	10	19	9	6	5	15
23	24	17	16	18	16	11	4	12	13	18	1

4. The table shows the number of books carried by pupils in class $2X_1$.

No. books (x)	Freq (f)
0	1
1	3
2	11
3	9
4	7

(a) How many pupils are in $2X_1$?

(b) Find the mean number of books.

(c) Copy the table and add a cumulative frequency column.

(d) Find the median.

5. The table below shows the results of asking class $1X_3$ to name their favourite month.

July	August	May	December	May	December	August	July
December	May	August	December	August	December	May	December
August	December	October	July	August	October	December	December
May	August	October	December	July	July	October	May
August	December	December	December	August	December	August	July

Construct a pie chart to show this information.

6. For the set of numbers in question 3,

(a) construct an ordered stem and leaf graph

(b) find the mode (c) find the median.

7. The percentages for a Maths test and an English test are shown in the table below.

Maths	55	65	60	70	70	85	80	90	90	90	95	85	60	70	40	85	100	100
English	60	70	60	70	50	75	90	95	90	85	90	95	70	60	50	85	95	80

(a) Construct a scattergraph and draw the line of best fit.

(b) Bob scored 80% in his English test.
Use your line to estimate his expected Maths score.

8. Eight white balls and four black balls are put into a bag.
What is the probability of randomly picking a black ball from the bag ?

9. A raffle has tickets 1 to 100. Calculate :-

(a) P(odd) (b) P(factor of 100) (c) P(square number).