S2 Block Test 1
Revision Booklet

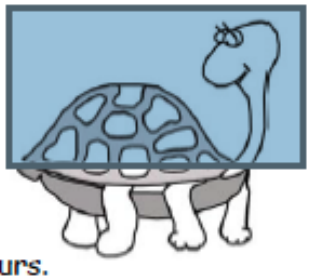
Speed Distance Time

Exercise 1 **Time, Distance & Speed**

1. Find the unknown quantity in each of the following :-

a	Distance = ? km	Speed = 20 km/hr	Time : 3 hours.
b	Distance = 90 miles	Speed = ? mph	Time : 1 hours.
c	Distance = 100 km	Speed = 40 km/hr	Time : ? hours.
d	Speed = 24 m/sec	Time = ? secs	Distance = 288 m.

2. a A tortoise walks at 2 metres per minute.
   How long will it take to walk 9 metres ?



   b Addison runs at 4 metres per second.
   How far will he travel in ten and a half seconds ?

   c A bus journey, 60 kilometres long, takes one and a half hours.
   How fast is the bus travelling ?

3. A jet has a 200 mile journey to complete.
   How long would it take at a speed of :-

   a 100 mph b 400 mph

4. 

   Jane ran round a 1500 metre track and took 6 minutes.

   a At what speed in metres per minute was Jane running ?

   b Bob beat Jane's time by a minute.
   What was Bob's speed ?

5. Ryan cycled from home to school (8 km) at a speed of 16 km/hr.
   He had to walk home from school due to a puncture.
   If Ryan walked at a speed of 6 km/hr, how much quicker was he cycling than walking ?

Speed Distance Time

Exercise 2 — Problems involving half/quarter hours

1. Find the unknown quantity in each of the following :-

a	Distance = ? km	Speed = 40 km/hr	Time : $2\frac{1}{2}$ hours.
b	Distance = 900 miles	Speed = ? mph	Time : $1\frac{1}{2}$ hours.
c	Distance = 210 km	Speed = 60 km/hr	Time : ? hours.
d	Speed = 240 km/hr	Time = 3 hrs 30 mins	Distance = ?
e	Speed = 100 m/min	Time = $2\frac{1}{4}$ mins	Distance = ?
f	Speed = 72 km/hr	Distance = 18 km	Time = ?

2. a A jogger took 1 hour and 15 minutes to cover 11·25 km.
   What was the average speed in km/hr ?

   b A boat takes 6 hours and 45 minutes at an average speed of 20 km/hr to travel from Port A to Port B.
   What far is it from Port A to Port B ?

3. 

A train leaves Ayton at 1500 hours and travels to Beeton 75 km away at 30 km/hr.
The train is due to arrive at Beeton at 1720.
Will it arrive on time ?

Exercise 3 — Converting hrs & mins to Decimal Times

1. Change the following to decimals of an hour :-

   a 45 minutes b 24 minutes c 36 minutes d 27 minutes.

2. Change the following to decimals of a hour. Give your answer to two decimal places :-

   a 7 minutes b 40 minutes c 8 minutes d 124 minutes.

3. Change each time to decimal form :-

   a 2 hrs 33 mins b 1 hr 48 mins c 5 hrs 6 mins d 3 hrs 3 mins.

Speed Distance Time

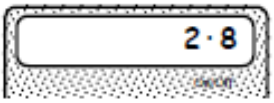
4. Calculate the unknown quantity in each of the following :-

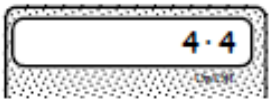
a	Distance = ? km	Speed = 80 km/hr	Time : 2 hrs 45 mins.
b	Distance = 64 miles	Speed = ? mph	Time : 1 hr 36 mins.
c	Distance = 420 km	Speed = 50 km/hr	Time : ? hrs ? mins .

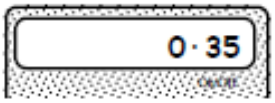
5. The distance between two towns Hurley and Burley is 48 kilometres.
Gerry drives a truck from Hurley to Burley at a speed of 30 km/hr.
On the return trip he increases his speed by 6 km/hr.
How much faster, in minutes and seconds, was the return trip ?

Exercise 4 Converting Decimal Times to Hrs & Mins

1. Change the calculator displays (shown in hours) to hours and minutes :-

a 

b 

c 

2. Change each of the following to hours and minutes :-

a 4·6 hours b 8·15 hours c 3·05 hours d 1·125 hours.

3. Calculate the time taken in hours and minutes for the following journeys :-

a A rally car travelling 150 kilometres at 40 km/hr.
b A marathon runner (26 miles) at a speed of 12 mph.
c A speed boat at 40 km/hr travelling 36 kilometres.

4. Change each of the following speeds to km/hr :-

a 20 m/sec b 250 m/sec c 10·5 m/sec d 50 cm/min.

5. In a Marathon race, Dale had a finishing time of 3 hours and 25 mins.
Alice had a finishing time of 3·4 hours.
Una completed her race in $3\frac{3}{8}$ hours.

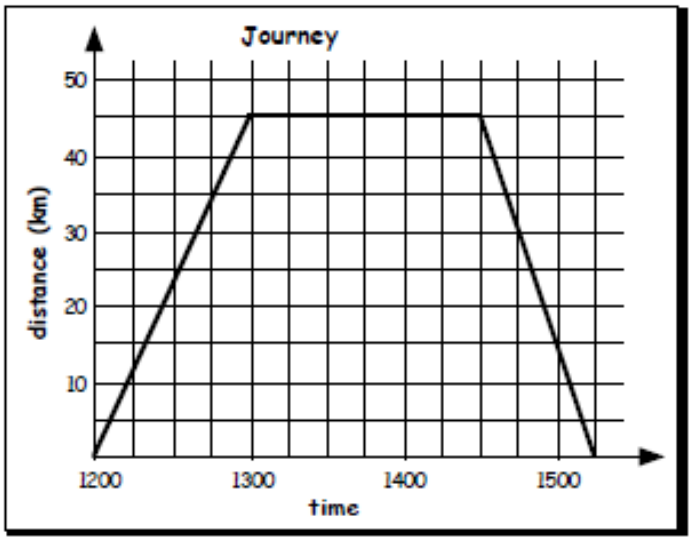
a Between these three people, who came :-
(i) first (ii) last ?

b What was the time difference between :-
(i) first and second (ii) first and last ?

Speed Distance Time

Exercise 5 Time, Distance (& Speed) Graphs

1. The distance-time graph shows the journey Maggie made from her house to her favourite clothes shop and home again.



   a. How long did the drive to the shop take ?

   b. How far away is the shop from her house ?

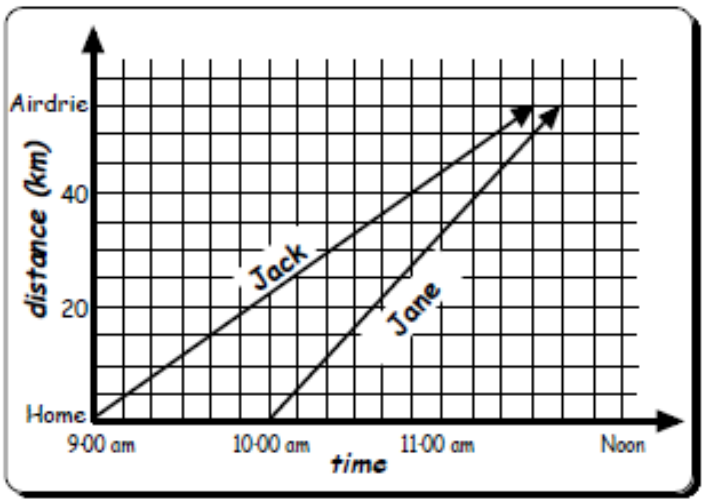
   c. How long did she stay at the shop ?

   d. Calculate Maggie's speed :-

      (i) going to the shop.

      (ii) on the journey home.

2. On Saturday, Mr Jenkins and Mrs Jenkins both leave from home and drive to Airdrie.



   a. At what time did each of the Jenkins leave their house ?

   b. How far away is Airdrie from their house ?

   c. Who arrived in Airdrie first and by how many minutes ?

   d. Calculate the average speed of both.

   e. **(Difficult)**. Mr Jenkins left Airdrie at Noon and drove home at 25 km/hr. Mrs Jenkins drove home at 30 km/hr.

      If they both arrived home at the same time, when must Mrs Jenkins have left Airdrie (to the nearest minute) ?

Speed Distance Time

3. Billy set off at 11·00 am on Sunday and travelled 50 miles to Edinburgh at an average speed of 40 mph. He shopped for 45 minutes in Edinburgh, then drove home at an average speed of 50 mph.

   Show Billy's journey on a Distance - Time graph.

4. Alan left home at ten past nine, driving at a speed of 60 km/hr, but found he had a puncture after just 20 km. It took him 40 minutes to get the puncture repaired and he then drove straight back home at 50 km/hr.

   Show this journey on a Distance - Time graph.

Revisit - Review - Revise Exercise 15

1. Choose the appropriate formula and show all working in each of the following :-
   - a Pauline drove 300 kilometres at 60 km/hr. How long did she take ?
   - b Arnie flew at 120 mph for 4 hours. How far had Arnie flown ?
   - c Kevin took 4 hours to cycle 60 kilometres. How fast was he cycling ?

2. Change each of the following times to decimals :-
   - a 48 mins b 3 hrs 12 mins c 1 hr 42 mins.

3. Change each time to hours and minutes :-
   - a 2·25 hours b 0·45 hours c 5·05 hours.

4. a Fred takes three quarters of an hour to drive 42 km to work.

   What is Fred's average speed ?

   b Jeri drives at 80 km/hr and takes 1 hour and 12 minutes to get to work.

   How far does Jeri drive to work ?

   c Terry the tortoise takes 40 minutes to crawl 16 metres. Sally Slug slithers 900 centimetres in 30 minutes.

   How much faster is Terry than Sally ?

5. Last Sunday, Chelsea left home at Noon and cycled 20 kilometres to her office. She arrived at 1·20 pm and spent 10 minutes collecting the papers she had forgotten. She then cycled home and arrived at 2.30 pm.
   - a Show all the given information on a distance-time graph.
   - b Calculate the speed of her journey :- (i) to the office (ii) home.

Answers

Exercise 1 - Time, Distance and Speed

1. a 60 km b 90 mph c 2·5 hrs d 12 secs
2. a 4·5 mins b 45 m c 40 km/hr
3. a 2 hrs b 0·5 hr
4. a 250 metres per min b 300 metres per min
5. 50 minutes

Exercise 2 - Problem solving - $^1/_2$ & $^1/_4$ hrs

1. a 100 km b 600 mph c 3·5 hrs
   d 840 km e 225 m f 15 mins
2. a 9 km/hr b 135 km
3. No - will be 10 minutes late

Exercise 3 - Convert Hrs & Mins to Dec. Times

1. a 0·75 hr b 0·4 hr c 0·6 hr d 0·45 hr
2. a 0·12 hr b 0·67 hr c 0·13 hr d 2·07 hr
3. a 2·55 hr b 1·8 hr c 5·1 hr d 3·05 hr
4. a 220 km b 40 mph c 8 hr 24 min
5. 16 minutes

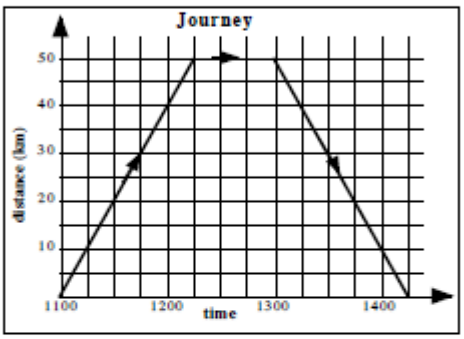
Exercise 4 - Convert Dec. Times to Hrs & Mins

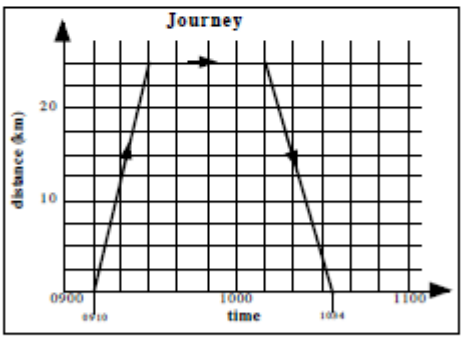
1. a 2 hr 48 min b 4 hr 24 min
   c 21 mins
2. a 4 hr 36 min b 8 hr 9 min
   c 3 hr 3 min d 1 hr 7·5 mins
3. a 3 hr 45 min b 2 hr 10 mins
   c 54 mins
4. a 72 km/hr b 900 km/hr
   c 37·8 km/hr d 0·03 km/hr
5. a (i) Una (ii) Dale
   b (i) 1 min (ii) 2 min 30 secs

Exercise 5 - Time, Distance and Speed

1. a 1 hr b 45 km c 1·5 hr
   d (i) 45 km/hr (ii) 60 km/hr
2. a 9 am and 10 am b 55 km
   c Jack by 10 mins
   d 22 km/hr & 36·7 km/hr
   e 12.22 pm

3/4



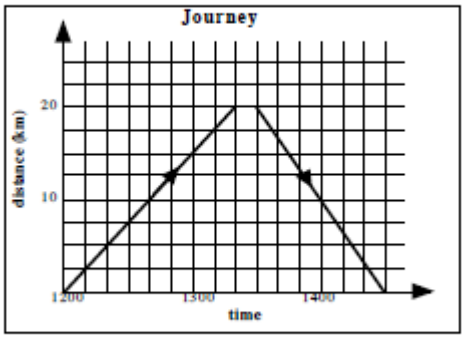


Review - Revisit - Revise Exercise 15

1. a 5 hrs b 480 mile c 15 km/hr
2. a 0·8 b 3·2 c 1·7
3. a 2 hr 15 min b 27 min c 5 hr 3 min
4. a 56 km/hr b 96 km
   c Terry - 24 m/hr, Sally - 18 m/hr (Terry)
   6 m/hr faster

Answers

5. a



b (i) 15 km/hr (ii) 20 km/hr

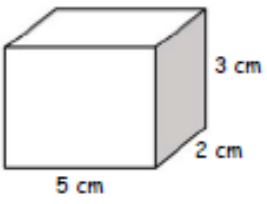
3D Shapes

Exercise 1 Volumes of Cubes & Cuboids

1. Copy and complete :- Volume = length x br..... x h.....

2. Use the formula to calculate the **volume** of the following cuboids :-

a



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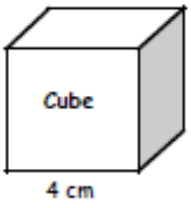

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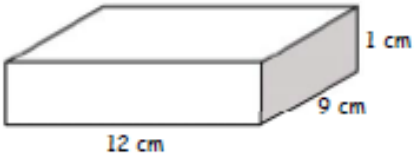
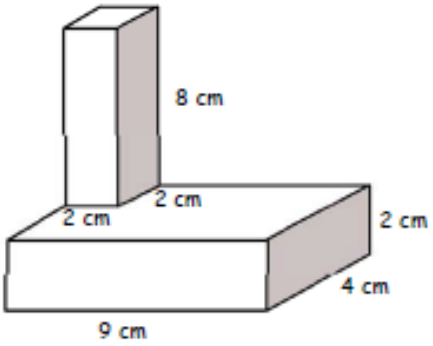


3. Find the total **volume** of each of the following shapes :-

a



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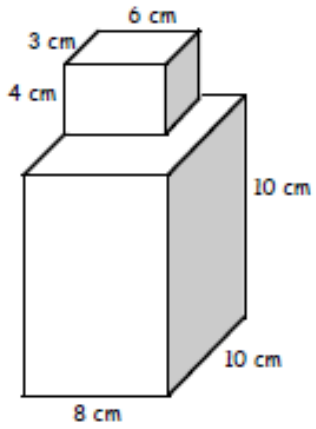
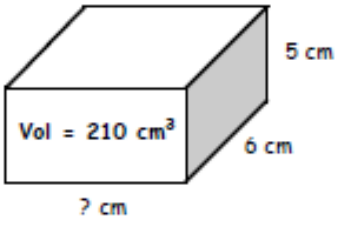


4. Calculate the length of the missing edge of each of the following cuboids :-

a



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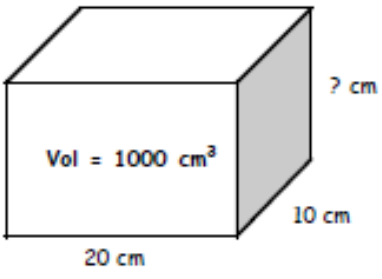


3D Shapes

Exercise 3 **Liquid Volume – Capacity**

1. Change each of the following to millilitres :-

   a 3 litres **b** 10 litres **c** 1·5 litres **d** 10·1 litres

   e half a litre **f** 5·12 litres **g** $^3/_4$ litre **h** 0·02 litres.

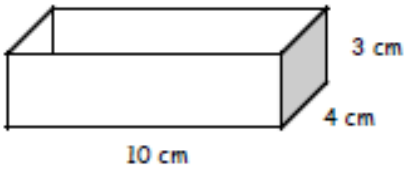
2. Change each of the following to litres :-

   a 8000 ml **b** 100 000 ml **c** 7500 ml **d** 1250 ml

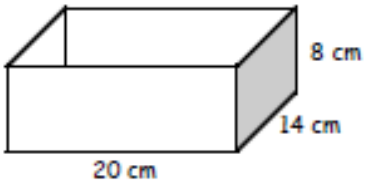
   e 10 010 ml **f** 300 ml **g** 50 ml **h** 8 ml.

3. Find the capacity (in millilitres) of each of these containers :-

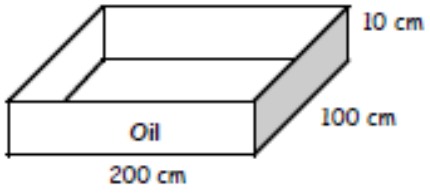
   a



   b



4. How many **litres** would it take to **half fill** the oil tray shown ?



Answers

Exercise 1 – Volumes of Cubes & Cuboids

1. $V = L \times B \times H$
2. a 30 cm^3 b 64 cm^3 c 108 cm^3
3. a 104 cm^3 b 872 cm^3
4. a 7 cm b 5 cm

Exercise 3 – Liquid Volume – Capacity

1. a 3000 ml b 10000 ml
   c 1500 ml d 10100 ml
   e 500 ml f 5120 ml
   g 750 ml h 20 ml
2. a 8 l b 100 l c 7·5 l d 1·25 l
   e 10·01 l f 0·3 l g 0·05 l h 0·008 l
3. a 120 ml b 2240 ml
4. a 100 litres

Patterns

Exercise 1 — Sequences & Patterns

1. Give a rule for each of these sequences :- (*begin with " start at ... and then ....."*).

   a 2, 5, 8, 11, 14, ... b 7, 13, 19, 25, ... c 25, 20, 15, 10, ...

   d 98, 81, 64, 47, ... e 3, 9, 27, 81, ... f 1, 6, 36, 216, ...

2. Write down the next two numbers in each sequence from question 1.

3. Find the next two numbers in each sequence :-

   a 7, 9, 11, 13, ... b 5, 9, 13, 17, ... c 24, 22, 20, ...

   d 70, 58, 46, 34, ... e 1, 3, 9, ... f 2, 4, 8, 16, ...

4. Shown is the pattern for **square numbers**.
   Write down the first 12 square numbers.

5. A pattern of numbers is defined as :- (2 x 3), (3 x 4), (4 x 5), (5 x 6) ....

   Write down the :- a 10^{th} term b 1000^{th} term c n^{th} term.

Exercise 2 — Simple Linear Patterns

1. Each door has six window panes.

   a Copy and complete the table.

   b Copy and complete the formula :- P = ... x D

   c How many panes would there be in 11 doors ?

   d How many doors are there if there are 78 panes ?

No. of Doors (D)	1	2	3	4	5
No. of Panes (P)	6	12	?	?	?
rises by : →		6	6	?	?	?

2. For the tables below :- (i) complete each one (ii) construct a formula.

   a No. of toys and price

T	1	2	3	4	5	6
P	9	18	27	..	..	..

P = ... x T

   b No. of seconds and no. of minutes

M	1	2	3	4	5	6
S	60	120	180	..	..	..

S = ... x M

   c No. of pentagons and no. of vertices

P	1	2	3	4	5	6
V	5	10	15	..	..	..

   d No. of tables to legs

T	1	2	3	4	5	6
L	8	16	24	..	..	..

Patterns

3. **Linear Graphs** – For each of the tables below :-

(i) complete each table (ii) construct a formula

(iii) take each pair of numbers as coordinates (iv) plot on a coordinate graph

(v) draw a line through the points and label the line with your formula.

a

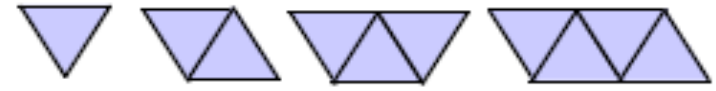
x	0	1	2	3	4	5
y	0	3	6	9	..	..

b

x	0	1	2	3	4	5
y	0	2	4	6	..	..

Exercise 3 Harder Linear Patterns

1. Look at the pattern shown.



a Copy and complete the table shown.

No. of triangles (T)	1	2	3	4	5	6
Perimeter (P)	3	4	5	..	..	..

1 1 1

b Copy and complete the formula for the above pattern :- $P = \ldots \times T + \ldots$

c Find the perimeter of the pattern with 21 triangles.

d Find the number of triangles if the perimeter is 27.

2. For each of the tables below :-

(i) complete each table (ii) construct a formula.

a

x	0	1	2	3	4	5
y	3	5	7	9	..	..

b

x	0	1	2	3	4	5
y	5	6	7	8	..	..

c

x	0	1	2	3	4	5
y	-2	1	4	7	..	..

d

x	0	1	2	3	4	5
y	-1	4	9	14	..	..

e

x	-2	-1	0	1	2	3
y	..	-4	-2	0	2	...

f

x	-2	-1	0	1	2	3
y	...	-11	-4	3	...	...

Answers

Ch 4 Ex 1 Sequences & Patterns

1. a start at 2 then add 3
   b start at 7 then add 6
   c start at 25 then subtract 5
   d start at 98 then subtract 17
   e start at 3 then times by 3
   f start at 1 then times by 6
2. a 17, 20 b 31, 37 c 5, 0
   d 30, 13 e 243, 729 f 1296, 7776
3. a 15, 17 b 21, 25 c 18, 16
   d 22, 10 e 27, 81 f 32, 64
4. 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144
5. a 11×12 b 1001×1002 c $(n+1) \times (n+2)$

Ch 4 Ex 2 Simple Linear Patterns

1. a 1 2 3 4 5 6
   6 12 18 24 30 36
   b $P = 6D$ c 66 d 13
2. a 1 2 3 4 5 6
   9 18 27 36 45 54 $P = 9T$
   b 1 2 3 4 5 6
   60 120 180 240 300 360 $S = 60M$
   c 1 2 3 4 5 6
   5 10 15 20 25 30 $V = 5P$
   d 1 2 3 4 5 6
   8 16 24 32 40 48 $L = 8T$
3. a 0 1 2 3 4 5 6
   0 3 6 9 12 15 18 $y = 3x$
   check linear diagram
   b 0 1 2 3 4 5 6
   0 2 4 6 8 10 12 $y = 2x$
   check linear diagram

Ch 4 Ex 3 Harder Linear Patterns

1. a 1 2 3 4 5 6
   3 4 5 6 7 8
   b $P = T + 2$ c 23 d 25
2. a 0 1 2 3 4 5
   3 5 7 9 11 13 $y = 2x + 3$
   b 0 1 2 3 4 5
   5 6 7 8 9 10 $y = x + 5$
   c 0 1 2 3 4 5
   -2 1 4 7 10 13 $y = 3x - 2$
   d 0 1 2 3 4 5
   -1 4 9 14 19 24 $y = 5x - 1$
   e -2 -1 0 1 2 3
   -6 -4 -2 0 2 4 $y = 2x - 2$
   f -2 -1 0 1 2 3
   -18 -11 -4 3 10 17 $y = 7x - 4$

Time

Exercise 1

1. Change the following to 24 hour times :-

(a) 8·30 am	(b) 1·50 pm	(c) 4·20 pm	(d) 9·01 pm
(e) 6·10 am	(f) 9·45 pm	(g) 11·12 pm	(h) 12·10 pm
(i) 7·08 pm	(j) 11·59	(k) 11·59 am	(l) midnight
(m) Quarter past nine at night		(n) Half past two in the afternoon	
(o) Quarter to six in the evening		(p) Twelve minutes to midnight.	

2. Change the following to 12 hour times :-

(a) 0440	(b) 1610	(c) 2205	(d) 1910
(e) 1130	(f) 0010	(g) 1255	(h) 1010
(i) 1706	(j) 0101	(k) 2010	(l) 0000

Exercise 2

1. How long is it from :-

(a) 3·05 pm to 5·20 pm	(b) 5·15 am to 8·55 am	(c) 6·30 pm to 8·05 pm
(c) 9·50 pm to 11·15 pm	(d) 1430 to 1945	(e) 0950 to 1605
(f) 1442 to 2020	(g) Quarter to six in the morning until five past nine at night.	

2. Kay is not sure which video to watch.

   (a) If she starts to watch one of the videos at 8·35 pm, list the finishing time of each video.

   (b) Kay decides to watch all three videos. What time would the last video finish ?

A	B	C
2 hrs 40 mins	1 hr 25 mins	2 hrs 55 mins

3. New york is 5 hours behind our time (ie Glasgow time 6 pm → New York time 1 pm).

   An aeroplane leaves Glasgow for New York at 1·45 pm with a flight time of 6 hours 35 mins.

   What is the time in New York when the plane lands ?

Solutions

Chapter 3 Exercise 1

1. a 0830 b 1350 c 1620 d 2101
   e 0610 f 2145 g 2312 h 1210
   i 1908 j 2359 k 1159 l 0000
   m 2115 n 1430 o 1745 p 2348
2. a 4-40 am b 4-10 pm c 10-05 pm d 7-10 pm
   e 11-30 am f 12-10 am g 12-55 pm h 10-10 am
   i 5-06 pm j 1-01 am k 8-10 pm l midnight

Chapter 3 Exercise 2

1. a 2 hrs 15 mins b 3 hrs 40 mins
   c 1 hr 35 mins d 1 hr 25 mins
   e 5 hrs 15 mins f 6 hrs 15 mins
   g 5 hrs 38 mins h 15 hrs 20 mins
2. a A = 11-15 pm
   B = 10-00 pm
   C = 11-30 pm
   b 3-35 am
3. 3-20 pm