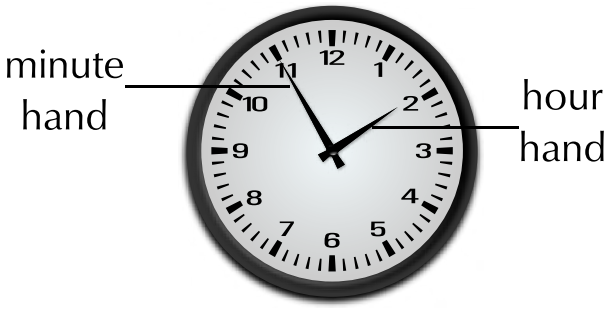
12-hour clock/analogue

8:00 a.m. or 8:00 p.m. are examples of readings of time using the 12-hour format. This format is seen on analogue clocks and watches. In the diagram and the pictures below, the short hand shows us the hour and the long hand shows us the minutes. Sometimes a third hand shows the seconds.



When we use the 12-hour clock, we use the letters "a.m." to show that the time is before midday (12 o'clock or noon) and "p.m." to show that it is after midday. For example, school may start at 7:30 a.m. (in the morning) and finish at 2 p.m. (in the afternoon).

NOTE:
Did you know that "a.m." stands for *ante meridiem*, which means "before noon" in Latin, and "p.m." stands for *post meridiem*, which is Latin for "after noon"?

24-hour clock/digital

20:00 is an example of the 24-hour time format. This format is seen on digital watches, clocks and on stopwatches. On digital clocks, the number on the left shows the hour and the number of the right shows the minutes. Some digital watches have a third, smaller number on the far right which shows us seconds.

The table below gives examples of 12- and 24-hour time. Look carefully at how to tell the time when it is midnight.

12-hour clock	12 a.m. (midnight)	3:00 a.m.	6:00 a.m.	9:00 a.m.	12 p.m. (midday)	3:00 p.m.	6:00 p.m.	9:00 p.m.
24-hour clock	0:00	3:00	6:00	9:00	12:00	15:00	18:00	21:00

Can you see how to convert from the 12-hour clock to the 24-hour clock?

If you compare the top line and bottom line of the table above, you will see that the times are written the same until midday. After midday, you simply **add** 12 to the the number of hours that have passed. For example: 3:00 p.m. is 3 hours after 12:00 p.m. (midday). 3 p.m. + 12 hours = 15:00. 8:30 p.m. is 8 hours 30 minutes after 12:00 p.m. 8 hours 30 minutes + 12 hours = 20:30.

To convert from the 24-hour clock to the 12-hour clock you **subtract** 12 from the number of hours. Don't forget to check whether your answer will be a.m. or p.m.! For example: 15:00 - 12 hours = 3:00. We know 15:00 is after midday, so the answer is 3:00 p.m. 20:00 - 12 hours = 8:00. 20:00 is long after midday, so the answer is 8:00 p.m.

Worked example 8: Converting between the 12-hour and 24-hour time formats

QUESTION

1. Write the following times in the 24-hour format (show all of your calculations):
   a) Jane goes to bed at 9:56 p.m.
   b) The local shop opens at 8:30 a.m.

c) Archie's cricket practice ends at 4:05 p.m.

2. Write the following times in the 12-hour format (show all of your calculations):

   a) David's school day ends at 14:45.

   b) Mrs Gwayi has morning tea at 10:25.

   c) The Dube family eat dinner at 19:35.

SOLUTION

1. a) 9:56 p.m. + 12 hours = 21:56

   b) 8:30 (This is before midday so it's written the same)

   c) 4:05 p.m. + 12 hours = 16:05

2. a) 14:45 − 12 hours = 2:45 p.m.

   b) 10:25 a.m. (This is before midday so it's written the same - we simply add the "a.m.")

   c) 19:35 − 12 hours = 7:35 p.m.

Activity 3 – 5: Converting between 12-hour and 24-hour clock times

1. Write the following times in the 12-hour format:

   a) The soccer game starts at 21:00.

   b) Elvis left the building at 17:40.

   c) Karen went to bed at 23:40.

   d) The moon rose at 00:13.

2. Write the following times in the 24-hour format:

   a) Lungile wakes up at 5:40 a.m.

b) Simphiwe ate dinner at 6:59 p.m.

c) Anna watched a movie that started at 7:18 p.m.

d) David got home from his night shift at 12:30 a.m.

Think you got it? Get this answer and more practice on our Intelligent Practice Service

1. 24DJ 2. 24DK

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Converting units of time EMG3Y

As with all the conversions we have already done, we use different units of time to measure different events. For example, you would measure the length of your school holidays in days or weeks, not seconds. But the time it takes to walk across a road would be measured in seconds, not years!

Worked example 9: Deciding on units of time

QUESTION

There are seven pictures below. Decide on the most appropriate unit of time for each situation.

1. The time it takes for a sprinter to run 100 metres.

2. A short taxi ride.

3. The amount of time you spend at school each day.

4. The duration of a cricket test match.

5. The length of the school holidays.

6. The time it takes crops to grow.

7. Your age.

SOLUTION

1. The amount of time it takes a sprinter to run 100 m would be measured in seconds.
2. A short taxi ride would be measured in minutes.
3. The amount of time you spend at school each day is measured in hours.
4. The length of a cricket test match is measured in days.
5. The length of the school holidays can be measured in weeks.
6. The time it takes crops to grow is measured in months.
7. Your age is measured in years.

There are 86 400 seconds in a day and 604 800 seconds in a week! These are large numbers and they are not always practical to work with. We can convert between different units of time to make our calculations simpler.

The relationship between the units are given in the table below.

Conversions for time
60 seconds = 1 minute
60 minutes = 1 hour
24 hours = 1 day
7 days = 1 week
365 days = approximately 52 weeks = 12 months = 1 year

NOTE:
Most of the time we use hundreds, tens, units to do calculations. However time does not work like this. Be careful not to make mistakes when doing time calculations.

Worked example 10: Converting units of time

QUESTION

1. It takes your teacher 5 minutes to walk to your classroom. How long does it take her to walk, in seconds?
2. Learners spend 4 hours in class before second break.
   a) How many minutes do they spend in class before second break?
   b) How many seconds do they spend in class before second break?
3. The bus takes 2 days to travel from Johannesburg to Cape Town, how many hours does it take?

4. It rained for 3 weeks continuously, how many days did it rain for?

Grade 8 learners have to study for 2 years to get to Grade 10.

5. a) How many months do they have to study for?
   b) How many days do they have to study for?

6. A class of Grade 10 learners took 2 hours to complete their Maths Literacy examination, how long did the exam take them, in seconds?

7. A taxi takes 30 minutes to travel from Mowbray to Wynberg, how many hours did the journey take?

8. Amanda's mother spent 49 days in Johannesburg. How many weeks did she spend away?

9. Busi planted corn that took 6 months to grow. How many years did it take for the corn to grow?

SOLUTION

1. 1 minute = 60 seconds
   Therefore 5 minutes = 5 × 60 seconds
   = 300 seconds

2. a) 1 hour = 60 minutes
      Therefore 4 hours = 4 × 60 minutes
      = 240 minutes

b) 1 minute = 60 seconds
Therefore 240 minutes = 240 × 60 seconds
= 14 400 seconds

3. 1 day = 24 hours
Therefore 2 days = 2 × 24 hours
=48 hours

4. 1 week = 7 days
Therefore 3 weeks = 3 × 7 days
= 21 days

5. a) 1 year = 12 months
Therefore 2 years = 2 × 12 months
= 24 months

b) 1 year = 365 days
Therefore 2 years = 2 × 365 days
= 730 days

6. 1 hour = 60 minutes
Therefore 2 hours = 2 × 60 minutes
= 120 minutes
1 minute = 60 seconds
Therefore, 120 minutes = 120 × 60 seconds
= 7200 seconds

7. 1 hour = 60 minutes
Therefore 30 minutes = $\frac{30}{60}$ hours
= $\frac{1}{2}$ an hour

8. 7 days = 1 week
Therefore 49 days = $\frac{49}{7}$ weeks
= 7 weeks

9. 12 months = a year
Therefore 6 months = $\frac{6}{12}$ years
= $\frac{1}{2}$ a year

In the above exercise we looked at how to do conversions that involve two steps - such as from seconds to hours or days to months. When we do conversions like these we simply break them up into smaller parts and do one conversion at a time. So, to convert from seconds to hours, we convert seconds to minutes and then minutes to hours. To convert days to months we can convert to weeks first, and then convert weeks to months.

In some cases we can also convert directly. for example, we know that there are 365 days in a year, so to convert days to years we don't have to first convert them to weeks or months, we can take a shortcut.

So far we have worked with simple time conversions that didn't involve remainders. What happens when we want to convert a number like 80 minutes to hours though? We know that there are 60 minutes in an hour, so we might be tempted to say that 80 minutes = $\frac{80}{60}$ hours = 1,33 hours. But what does "1,33 hours" mean? It **does not** mean 1 hour and 33 minutes! We must be very careful when working with time

conversions: we cannot always use metric remainders (like 0,33 hours), because time is not metric! Instead, we have to solve for one unit (hours, minutes, seconds) at a time and carefully work out the remainders.

The following worked example will show us how to do this.

Worked example 11: Converting units of time (more complex conversions)

QUESTION

1. It takes John 140 seconds to boil water in a kettle. How many minutes and seconds does the water take to boil?

2. A movie lasts 138 minutes. How long is the movie in hours and minutes?
3. A train journey takes 34 hours. How many days and hours does the journey take?

SOLUTION

1. 60 seconds = 1 minute
   Therefore 140 seconds = $\frac{140}{60} = 2{,}33$
   This **does not** mean 2 minutes 33 seconds!
   From our answer of 2,33 we know that we have 2 whole minutes and some remainder in seconds.
   We can now work backwards to calculate the remainder:
   2 minutes = 120 seconds.
   140 seconds - 120 seconds = 20 seconds.
   So 140 seconds = 2 minutes and 20 seconds.

2. 60 minutes = 1 hour.
   Therefore 138 minutes = $\frac{138}{60} = 2{,}3$
   This **does not** mean 2 hours and 3 minutes!

We know that we have 2 whole hours and some remainder in minutes.
We now work backwards to calculate the remainder:
2 hours = 120 minutes
138 minutes - 120 minutes = 18 minutes
So 138 minutes = 2 hours and 18 minutes.

3. 24 hours = 1 day
   Therefore 34 hours = $\frac{34}{24}$ = 1,417
   This **does not** mean 1 day and 417 hours!
   From our answer of 1,417 we know that we have 1 whole day and some remainder in hours.
   We now work backwards to calculate the remainder:
   1 day = 24 hours
   34 hours - 24 hours = 10 hours
   So 34 hours = 1 day and 10 hours

Activity 3 – 6: Converting units of time

1. A jogger runs for 40 minutes.
   a) How many hours does he run for? (Give your answer as a fraction).
   b) How many seconds does he run for?

2. A school camp last 3 days.
   a) How many hours long is the camp?
   b) How many minutes long is the camp?
   c) How many seconds long is the camp?
3. Carine goes on holiday for 6 weeks.
   a) How many days is she away for?
   b) How many hours is she away for?
4. Vusi is ill for two and a half days. For how many hours is he ill?
5. An advert on TV lasts 70 seconds. How long does the advert last, in minutes and seconds?
6. A chicken takes 100 minutes to roast in the oven. How long it does it take to roast, in hours and minutes?

7. A plane trip (with stopovers) from South Africa to China takes 38 hours. How many days and hours does the trip take?

Think you got it? Get this answer and more practice on our Intelligent Practice Service

1. 24DM 2. 24DN 3. 24DP 4. 24DQ 5. 24DR 6. 24DS
7. 24DT

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Calculating elapsed time EMG3Z

Being able to do calculations with time is a very useful skill to have. It is important to know how to plan and organise your time on a daily basis. For example, if it takes you a certain amount of time to walk to school, what time must you leave home in the morning to arrive in time for class? Or, if you need to help cook dinner at 7pm, how much time do you have to finish your homework?

In this section we will look at how to calculate elapsed time. When doing calculations like this, we add the units of time separately, and don't forget to be careful when working with remainders!

Worked example 12: Calculating elapsed time

QUESTION

1. School starts at 07:45. You are in class for 2 hours 30 minutes. What time will the bell ring for first break? Give your answer in the 24-hour format.
2. Palesa starts cooking dinner at 6:00 p.m. She has to leave for her choir practice in 1 hour and 45 minutes.
   a) What time must she leave? (Give your answer in the 12-hour format).
   b) Convert your answer to the 24-hour format.

The bus leaves school at 14:30. It takes 70 minutes to get to Mulalo's house.

3. a) What time will he arrive at home? (Give your answer in the 24-hour format).
   b) Convert your answer to the 12-hour format.

4. Mark leaves for work at 07:45. He arrives at 08:10. How long did it take him to get there? (Give your answer in minutes).

5. Lebogang goes for a walk around her neighbourhood at 4:20 p.m. She gets back home at 5:40 p.m. How long did she walk for? (Give your answer in hours and minutes).

6. Russel finishes soccer practice at 4:00 p.m. It takes him 10 minutes to walk home. He then spends 80 minutes doing his homework.

   a) What time will Russel finish his homework? (Give your answer in the 12-hour format).
   b) Convert your answer to the 24-hour format.

Ewald's hockey practice starts at 15:10 and ends at 16:30.

7. a) How long was his hockey practice? (Give your answer in hours and minutes).
   b) If it takes him 40 minutes to get home from hockey, what time will he arrive at home? (Give your answer in the 12-hour format)

SOLUTION

1. First add the hours: 07:00 + 2 hours = 9:00
   Then add the minutes:
   45 minutes + 30 minutes = 75 minutes
   75 minutes = 60 minutes and 15 minutes = 1 hour and 15 minutes
   Calculate the total time elapsed:
   9:00 + 1 hour 15 minutes = 10:15
   So the bell will ring for break at 10:15.

2. a) First add the the hours: 6:00 p.m. + 1 hour = 7:00 pm
Then add the minutes: 0 minutes + 45 minutes = 45 minutes
Calculate the total time that will elapse: 7:00 p.m. and 45 minutes = 7:45 p.m.
So Palesa must leave at 7:45 p.m.

   b) To convert this to the 24-hour time format we simply **add** 12 hours to the time:
7:45 p.m. + 12 hours = 19:45.

3. a) First we break down 70 minutes into hours and minutes:
We know that 60 minutes = 1 hour. 70 minutes - 60 minutes = 10 minutes, so the bus ride takes 1 hour and 10 minutes.
Now we add the hours:
14:30 + 1 hour = 15:30
Next we add the minutes: 15:30 + 10 minutes = 15:40.
So Mulalo will arrive home at 15:40

   b) To convert our answer to the 12-hour format we **subtract** 12 hours:
15:40 - 12 hours = 3:40. We know that 15:40 is after midday, so Mulalo will arrive home at 3:40 p.m.

4. 7:45 to 8:10 is less than an hour. So in this case we only need to add the minutes it took Mark to get to work.
7:45 + 15 minutes = 8:00
8:00 + 10 minutes = 8:10
10 minutes + 15 minutes = 25 minutes
So it took Mark 25 minutes to get to work.

5. 4:20 p.m. + 1 hour = 5:20 p.m.
5:20 p.m. + 20 minutes = 5:40 p.m.
So Lebogang walked for 1 hour and 20 minutes.

6. a) We need to add two values to get our answer here: the time it takes Russel to walk home and the time it takes him to finish his homework.
First we add the time it took him to walk home after soccer practice:
4:00 p.m. + 10 minutes = 4:10 p.m.
Next we must add the time it took him to do his homework:
We know that 60 minutes = 1 hour.
$\frac{80}{60}$ = 1,34 so 80 minutes is one hour plus some remainder of minutes.
80 minutes - 60 minutes = 20 minutes.
So it takes Russel 1 hour and 20 minutes to do his homework.
Now we add this to the time he got home:
First we add the hours: 4:10 p.m. + 1 hour = 5:10 p.m.
Then we add the minutes: 5:10 p.m. + 20 minutes = 5:30 p.m.
So Russel finishes his homework at 5:30 p.m.

   b) To convert our answer to the 24-hour format we simply add 12 hours:
5:30 p.m. + 12 hours = 17:30.

7. a) 15:10 + 1 hour = 16:10.
16:10 + 20 minutes = 16:30.
1 hour + 20 minutes = 1 hour and 20 minutes.
So Ewald's hockey practice was 1 hour and 20 minutes long.

   b) We can divide the 40 minutes it takes Ewald to get home into 30 + 10 minutes to make it easier to add:
16:30 + 30 minutes = 17:00

17:00 + 10 minutes = 17:10
So Ewald gets home at 17:10.
To convert this to the 12-hour format we subtract 12 hours:
17:10 - 12 hours = 5:10. We know that 17:10 is after midday so the converted time is 5:10 p.m.

Activity 3 – 7: Calculating elapsed time

1. Unathi's father goes to work at 8:00 a.m. He fetches her from school 7 hours and 30 minutes later. What time will he fetch Unathi? Give your answer in the 24-hour format.
2. Lauren finishes her music class at 15:30. It takes her 30 minutes to get home. She then does homework for 50 minutes. Lauren meets her friend 20 minutes after she finishes her homework. What time do they meet? Give your answer in the 12-hour format
3. Heather starts baking biscuits at 6:15 p.m. The biscuits must come out of the oven at 6:35 p.m. and need to cool for another 20 minutes before they can be eaten.
   a) How long will the biscuits be in the oven for?
   b) What time will they be ready to eat? (Give your answer in the 12-hour format)

4. a) Alison's favourite TV show starts at 20:35. It is forty-five minutes long. What time will it finish?
   b) If Alison watches the movie that follows her favourite show and it finishes at 10:50 p.m., how long was the movie (in hours and minutes)?
5. Vinayak is meeting his brother for lunch at 13:15. He also wants to go to the shops before lunch. It will take him 20 minutes to get from the shops to the restaurant where he's meeting his brother. If he leaves home at 10:10 how much time does he have to do his shopping? Give your answer in hours and minutes.

Think you got it? Get this answer and more practice on our Intelligent Practice Service

1. 24DV 2. 24DW 3. 24DX 4. 24DY 5. 24DZ

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Calendars EMG42

Calendars are useful tools to help us keep track of events that are going to happen and to plan our lives accordingly. We can add information to them about important events and dates (like birthdays and school holidays) to a calendar, to help us remember what is happening when. We can read off days, weeks and months on a calendar and do conversions between these units of time.

You may have come across one more time conversion that states that 4 weeks is approximately equal to one month. This is not correct. 4 weeks is equal to 28 days, and the months of the year (except February!) have 30 or 31 days in them. When working with calendars, be careful to count the right number of days in a particular month!

Worked example 13: Using a calendar

QUESTION

Jess's calendar for the month of May is given on the next page. Study it carefully and answer the questions that follow:

MAY 2013

MON	TUES	WED	THURS	FRI	SAT	SUN
		1 Workers' Day	2 Dad's birthday	3	4	5
6	7 Netball match	8	9	10	11	12 Mother's day
13	14	15	16	17 School camp	18 School camp	19 School camp
20	21	22 Maths Lit test	23	24	25 Granny comes to visit	26
27	28	29	30	31		

1. If it is Monday 6 May calculate how many days it is until:
   a) Mother's Day.
   b) Jess goes on her school camp.
   c) Jess's granny comes to visit.
2. If it is the 8 May:
   a) how many weeks does Jess have to study for her Maths Literacy test?
   b) How many days does she have to study for the test?
   c) How many weeks ago was her dad's birthday?
3. Will Jess go to school on 1 May? Give a reason for your answer.
4. Jess needs to buy a present for her mother for Mother's Day. If she has plans with friends on 11 May, by when should she have bought the present?
5. Jess is invited to a party on Saturday 18 May. Will she be able to attend?
6. Jess wants to bake a cake for her granny but has plans with a friend for the morning of 25 May.
   a) If her granny arrives in the evening of 25 May, when should Jess bake the cake?
   b) Given that she's busy on the morning of 25 May, when should Jess make time to buy the ingredients for the cake?

SOLUTION

1. a) 6 days
   b) 11 days
   c) 19 days
2. a) 2 weeks
   b) 14 days
   c) 0 weeks ago - it was 6 days ago.
3. No. 1 May is Workers' Day which is a public holiday.
4. Jess should buy a present for her mother by Friday 10 May.
5. No. She will be away on her school camp.
6. a) On the afternoon of Saturday 25 May.
   b) On or before Friday 24 May.

Activity 3 – 8: Creating your own calendar

1. You need to create a calendar (like the one in the previous worked example) for one month of the year. It should include the following:
   - close relatives' birthdays (that happen in that month)
   - any classmates' birthdays
   - sports fixtures
   - test and/or exam dates and times
   - school functions or events.

Think you got it? Get this answer and more practice on our Intelligent Practice Service

1. 24F2

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Timetables EMG43

Timetables are similar to calendars in that they help us plan our time. Where calendars are useful for planning months and years, timetables are useful for planning shorter periods of time like hours, days and weeks. You may already be familiar with timetables

like those for your different classes at school, and for TV shows. In this section we will learn how to read timetables and how to draw up our own.

Worked example 14: Using a timetable

QUESTION

Look at the timetable below and answer the following questions.

	SABC 1	SABC 2	SABC 3	e-TV
5:30 p.m.	Siswati/Ndebele News	News	Days of Our Lives	It's My Biz
6:00 p.m.	The Bold and the Beautiful	Leihlo La Sechaba		eNews Early Edition
6:30 p.m.	Zone'd TV	7de Laan	On The Couch	Rhythm City
7:00 p.m.	Jika Majika	Nuus	News	eNews Prime Time
7:30 p.m.	Xhosa News	American Idol	Isidingo	Scandal!
8:00 p.m.	Generations		Welcome to The Parker	Mad About You
8:30 p.m.	Shakespeare: uGugu No Andile	News		Panic Mechanic
9:00 p.m.		Muvhango		

1. What is the difference in time between the English News at 5:30 p.m. and the English News at 8:30 p.m. (both on SABC 2)?
2. How long, in minutes, is American Idol?
3. If Zonke wants to watch Isidingo after dinner at 7:30 p.m., and she needs 90 minutes to cook and eat dinner, what time should she start cooking dinner?
4. Mandla wants to watch It's My Biz and Generations. He plans to do his homework in between the two shows. If he expects each subject's homework to take 30 minutes, how many subjects worth of homework will he be able to complete between the two shows?
5. Sipho wants to watch the news in English and in Afrikaans, at the same time. Would this be possible? Give a reason for your answer.
6. Why are the blocks on the timetable for SABC 3, blank for 8:30 p.m. and 9:00 p.m.? What do the blank blocks represent?
7. What is the **total** time period allocated to the News (in all languages) across all four TV channels?

SOLUTION

1. 3 hours.
2. 7:30 to 8:30 p.m. = 1 hour = 60 minutes.
3. 90 minutes = 1 hour + 30 minutes
   7:30 p.m. - 1 hour = 6:30 p.m.
   6:30 p.m. - 30 minutes = 6:00 p.m.
4. It's My Biz finishes at 6:00 p.m. and Generations starts at 8:00 p.m. This gives Mandla 2 hours to do his homework.
   2 hours = 120 minutes.
   120 minutes ÷ 30 minutes = 4
   So Mandla will be able to do homework for four subjects in between the two shows.
5. Yes, there is the English News on SABC 3 at 7:00 p.m. and on SABC 2 there is the Afrikaans Nuus at that same time. However, he cannot watch two channels at the same time. He would need to choose a channel to watch.
6. They are blank because the program "Welcome to the Parker" is still showing.
7. There are 8 sets of news slots appearing on the timetable. Each slot is 30 minutes. Therefore, a total of 4 hours of news will be shown between 5:30 p.m. and 9:00 p.m. on four channels.

Activity 3 – 9: Writing up a timetable

1. Sipho and Mpho are brothers. Their parents require them to do household chores every day. These chores need to fit into their school sports and homework timetables.

   Using the information provided in the table below, construct a timetable for each brother for **one** day of the week.

   The two brothers' timetables need to be clearly laid out and easy to read.

SIPHO	MPHO
Soccer practice 15:30 - 16:30	Piano lesson (1 hour) 
Feed the dogs	Walk the dogs for a minimum of 30 minutes
Do the dishes 	Study for his Maths test: 45 minutes
Complete his Life Orientation task: 45 minutes	Set (and clear) the table before and after dinner
Watch the news at 19:00 for his history assignment	Look through the newspaper for any information on natural disasters for his geography homework.

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1. 24F3

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3.5 End of chapter activity EMG44

Activity 3 – 10: End of chapter activity

Thobeka is planning an end of term party for her classmates on a Saturday afternoon, and needs help with her measurement conversions and time management. Answer the questions that follow, and don't forget to show your working out.

1. Thobeka has a large table that she wants to use for drinks and snacks. She measures the table to be 164 cm wide.

   a) Convert the width of the table into metres.

   b) If she has a tablecloth that is 1500 mm wide, will it fit over the table? If not, by how many cm will it be too short?

c) Thobeka has chairs that are 0,4 m wide. How many chairs can she fit along one side of the table?

2. Thobeka wants to make party packets for her friends, and decides to tie them closed with pieces of ribbon. Each bag needs 100 mm of ribbon.

   a) How many centimetres of ribbon does each bag require?

   b) If Thobeka needs to tie 25 bags, how much ribbon will she need in total, in centimetres?

   c) How many metres of ribbon will Thobeka need to buy?

   d) How much will it cost?

3. Thobeka is going to buy snacks, including chips and biscuits, for her friends.

   a) Each packet of chips weighs 50 g. How much is this in kg?

   b) If each packet of chips weighs 50 g and she wants to buy 1 kg of chips in total, how many packets will she have to buy?

   c) Thobeka buys 1 kg of chips and 400 g of biscuits. What is the ratio of the weight of chips to the weight of biscuits? Write the ratio in its simplest form.

   d) Thobeka asks each of her friends to bring a bag of sweets. If each friend brings a 500 g bag and 20 friends arrive, how many kilograms of sweets will there be in total?

4. Thobeka is also planning to make orange juice using orange concentrate and water. According to the concentrate bottle, she needs to mix 1 part concentrate with 10 parts water.

   a) What is the ratio of juice to water that Thobeka needs to mix?

   b) If she uses 300 ml of concentrate, how much water must she add to dilute it? (in ml)

   c) How much juice will she have in total (concentrate + water), in litres?

   d) If each paper cup at the party can hold 200 ml, how many cups of juice will Thobeka be able to fill completely?

   e) If Thobeka mixes 400 ml of concentrate, and 4 ℓ of water, so that the total volume of juice is 4,4 ℓ of juice, what percentage of the juice is concentrate?