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# 24 Solving Problems with Time



## Introduction

Solve problems using time to find how much time has gone past, or the **elapsed time**. You can also find the time something started or ended.

Yuri left for school at 8:15 A.M. It took him 25 minutes to get to school.

Add to find what time Yuri got to school.

$$\begin{array}{r} 8:15 \leftarrow \text{Start Time} \\ +0:25 \leftarrow \text{Time Interval} \\ \hline 8:40 \leftarrow \text{End Time} \end{array}$$

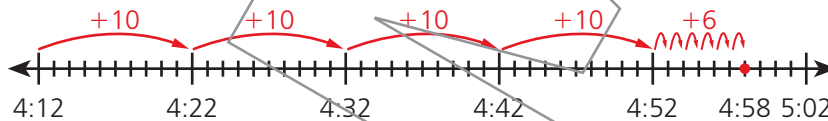
Yuri arrived at school at 8:40 A.M.

Yuri left his friend's house at 4:12 P.M. and arrived home at 4:58 P.M.

$$\begin{array}{r} 4:58 \leftarrow \text{End Time} \\ -4:12 \leftarrow \text{Start Time} \\ \hline 0:46 \leftarrow \text{Time Interval} \end{array}$$

It took Yuri 46 minutes to get home from his friend's house.

A number line can help you solve problems with time.



**Elapsed time** is also called a **time interval**.

Remember that the times between midnight and noon are A.M. times. The times between noon and midnight are P.M.

You will also use subtraction to find the start time when you know the end time and the elapsed time.

### Think About It



What time does your school start in the morning? What time do you leave your house to go to school? Find the amount of time that goes by from the time you leave your house to the time your school starts. Why is this important to know?

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**Use subtraction to find the time something started when you know the time it ended and how much time passed. Use addition to find the end time when you know the time something started and how much time passed.**

- Astrid finished her homework at 6:55 P.M. She had worked on her homework for 40 minutes.

What time did Astrid finish? \_\_\_\_\_

How much time had elapsed since she started? \_\_\_\_\_

Is the time she started before 6:55 or after 6:55? \_\_\_\_\_

Do you need to use subtraction or addition to find the time Astrid started her homework? \_\_\_\_\_

Use the correct operation to find the time she started her homework.

What time did Astrid start her homework? \_\_\_\_\_

As soon as she finished her homework, Astrid practiced piano for 25 minutes.

What time did Astrid start practicing her piano? \_\_\_\_\_

How long did she spend practicing? \_\_\_\_\_

What operation should you use to find the time Astrid finished practicing piano? \_\_\_\_\_

Use the correct operation to find the time she finished practicing piano.

What time did Astrid finish practicing piano? \_\_\_\_\_

When you add or subtract across an hour, you may need to regroup 60 minutes as 1 hour or 1 hour as 60 minutes.

**Time lines, or number lines, can also help you solve problems with time.**

- ▶ Troy and Aamir met at the playground at 10:10 A.M. They played for 65 minutes.

Use a number line to find the time that the boys finished playing.



What time did the boys start playing? \_\_\_\_\_

Where is this time on the number line? \_\_\_\_\_

The number line shows marks for 10 minutes. Write the actual time under each mark on the number line above.

What time did the boys finish playing? \_\_\_\_\_

There are 60 minutes in an hour.

**Use what you know about time to fill in this table.**

Start Time	End Time	Elapsed Time
11:14		33 minutes
	9:02	1 hour 2 minutes
5:27	6:08	

Solve the following problems.

- 1** Bryan worked on a science project from 10:07 A.M. to 10:49 A.M. How many minutes did he work on his project?

Should you add or subtract to find the elapsed time?

**Answer** \_\_\_\_\_ minutes

- 2** Baz got to the library at 7:45 A.M. He read the sign on the library. How long will he have to wait before the library opens?

**PUBLIC LIBRARY**  
Daily Hours  
9 A.M.—6 P.M.

**Answer** \_\_\_\_\_

- 3** The elementary music program began at 7:00 P.M.

**Part A** The first half of the program ended at 7:46. There was a 12-minute break before the second half started. What time did the second half start? Show your work.

**Answer** \_\_\_\_\_

**Part B** The second half of the program lasted 38 minutes. How long was the entire elementary music program? Show your work.

Remember to include the break as part of the program.

**Answer** \_\_\_\_\_

Solve the following problems.

- 1 Lexi left to go to the park at 3:15 P.M. She got to the park at 3:42 P.M. How long did it take Lexi to get to the park?

**Answer** \_\_\_\_\_ minutes

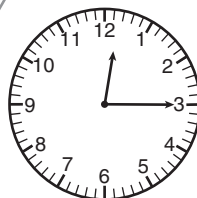
- 2 Paul finished cleaning his room at 4:50 P.M. after working on it for 43 minutes. What time did Paul start cleaning his room?

- A** 4:17 P.M.  
**B** 4:53 P.M.  
**C** 4:43 P.M.  
**D** 4:07 P.M.

- 3 Colby began making lunch at the time shown on the left. He finished at the time shown on the right.



Start



End

How long did it take Colby to make lunch? Show your work.

**Answer** \_\_\_\_\_ minutes

- 4** Deb started exercising at 11:11 A.M. She exercised for 39 minutes. Use the time line to find what time Deb finished exercising.



**Answer** \_\_\_\_\_

- 5** Dion started reading a book at 10:10 A.M. He stopped reading at 12:00 noon. How long did Dion read?

- A** 50 minutes
- B** 1 hour 40 minutes
- C** 1 hour 50 minutes
- D** 2 hours 10 minutes

- 6** Jerome flew from Dallas, Texas, to Chicago, Illinois. He left Dallas at 1:45 P.M. and arrived in Chicago at 4:05 P.M. Rachel also flew from Dallas to Chicago. She left Dallas at 9:00 A.M. and arrived in Chicago at 11:35 A.M. Whose flight took the longer amount of time? Explain.

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- 7** Norah has homework in different subjects. Complete the table to show the start time, end time, or elapsed time for each subject's homework.

Subject	Start Time	End Time	Elapsed Time
Math	3:55	4:13	
Reading		4:45	30 minutes
Spelling	4:47		24 minutes
Science	5:14	5:22	



- 8 Liam is taking a train to visit his grandparents. The train schedule below shows the trains that leave from Liam's town. All the trains stop in the town where his grandparents live.

TRAIN SCHEDULE

Train Number	Departs
245	7:30 A.M.
119	8:45 A.M.
21	9:45 A.M.
1010	12:15 P.M.

- Part A** Liam wants to get to his grandparents' town close to 10:30 A.M. The trip takes 1 hour 30 minutes. What train should Liam take?

**Answer** \_\_\_\_\_

- Part B** It takes Liam 1 hour 20 minutes to get ready and get to the train. If he starts getting ready at 7:15 A.M., will he be able to catch the 8:45 A.M. train? Explain.

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