Math Challenge #7

Time and Calendar

Welcome to Math Challenge #7. This math challenge has math problems involving time and calendars. Humans started telling time centuries ago. Initially people guessed the time of day by looking at the sun's position. The sundial followed, which uses a shadow caused by the sun. The number the shadow rests on indicates the time.
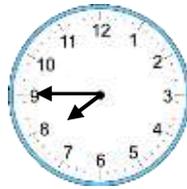
Today, we use analog clocks, which tell time using dials, and digital clocks, which display the hour and minutes. We also use AM (a.m.) and PM (p.m.) to indicate morning or night. AM (abbreviation for the Latin phrase Ante Meridiem) means it is morning time from midnight to noon. PM (Latin for Post Meridiem) is from noon to midnight.

We also organize our days for activities using a calendar. A calendar shows the days, weeks, and months of a specific years. Understanding the fundamentals of our calendar system is essential. Enjoy the following problems from reading clocks to solving time problems and calendar problems.
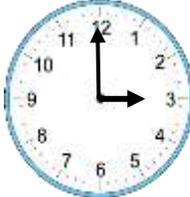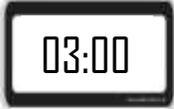
If you are new to any of the problem solving strategies, check out our complete overview of elementary problem solving strategies at https://www.mathinaction.org/problem-solving-strategies.html.

Kinder & First Grade: solve at least 3 problems.
Second & Third Grade: solve at least 7 problems.
Fourth Grade and above: solve at least 12 problems.

		Answer
1.	Dylan's baseball practice started at 5:00 p.m. and ended at 7:00 p.m. How many hours did the practice last?	
2.	Anjali has exactly one hour to get ready before the school bus picks her up at 8 a.m. Find the time when she has to get up in the morning.	
3.	These are the days of the week: Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday. a. If yesterday was Saturday, what day is tomorrow? b. If tomorrow is Monday, what day is the day before yesterday?	*a.* *b.*
4.	Alexander has a busy schedule on Friday. He has two back-to-back activities at the community center with no break. He takes a dance class and has a 30-minute piano lesson afterward. The clock on the left shows the time when Alexander's piano lesson ends. His dance class lasts 1 hour. What time did he start his dance class?	
5.	School starts at 9 a.m. How much time, in minutes, does Doan have if it is now a quarter before 8 a.m.?	

6.	Hayley woke up at 6:30 a.m. Her brother woke up 2 hours later. Her mom woke up 3 hours before her brother. What time did Hayley's mom wake up?	
7.	Last Saturday, Caitlin had breakfast at 8:30 a.m. Her drama rehearsal started an hour later and lasted for two hours. What time did her drama rehearsal end?	
8.	Days of the week.	
	a. If January 1st falls on Thursday, what day is January 31?	*a.*
	b. If Halloween (October 31st) falls on Wednesday, what day is October 1?	*b.*
	c. If April Fool's Day (April 1st) falls on Sunday, what day is March 21?	*c.*
9.	Arjun took 3 hours and 20 minutes to work on ten challenging math problems. Max solved the same problems twice as fast as Arjun. Both of them started working on the problems at 1:30 p.m. At what time did Max finish solving the problems?	
10.	A coffee shop is open from 6 a.m. to 2:30 p.m. on weekdays and from 6 a.m. to 4:30 p.m. on Saturdays and Sundays. How long, in hours, is the coffee shop open in a week? Express your answer in mixed number.	
11.	Daily trains leave the station every half hour. The first train leaves at 9:10 a.m. What time will the seventh train leave?	
12.	At the end of a power outage, a digital clock resets to 12:00 a.m. In the morning after the power outage occurred, the digital clock showed 4:50 a.m. while the actual time was 7:30 a.m. At what time did the power outage end?	
13.	a. If two days ago was Friday, what day is 3 days from today?	*a.*
	b. If yesterday was Saturday, what day is 100 days from today?	*b.*

14.	Anika takes 8 minutes to run one loop around the school track. Ashley can run the same loop 7 times in one hour. Cynthia takes 1 minute longer than Anika to run the same loop. List the names of these runners in order from the fastest to slowest.	
15.	At 3:00 p.m. a clock shows the correct time. The clock is broken so that, for every hour that passes, the clock will be 12 minutes behind. For example, at 4:00 p.m. the clock will show 3:48 p.m. In how many hours will it next show the correct time? *Hint: make a chart/table or an organized list to notice a pattern.*	
16.	A digital timer counts down from 3 minutes (03:00) to 0 (0:00), one second at a time. How many times during the countdown does at least one of the three digits show a 2? *Hint: make a chart or an organized list.*	
17.	A family is moving from Tacoma to Lynnwood. Their car traveling at 60 mph on Interstate 5 **is 2 miles behind the U-Haul truck** traveling at 50 mph in the same direction. How long, in minutes, will it take the car to catch up to the U-Haul truck?	
18.	Many places in the world use the 24-hour time format. 24-hour time format is similar to the regular AM/PM time, except that you keep counting up after you get past 12 PM (noon). Larissa's bedside clock displays the time in 24-hour format. For example, when the clock shows as shown in the picture, it is 8:22 p.m. in a 12-hour time format. How many times in a 24-hour period do all four digits change at the same time?	

Solution is available on January 20, 2023
www.mathinaction.org