**Lower Elementary:**

*Question:* The year is 2018. A time traveler transports himself 40 years back in time, then 20 years forward in time, then 34 years back in time. What year is it for the time traveler now?

**Upper Elementary:**

*Question:* Rose works for Henrik’s department store where she makes $9.00 per hour. She begins her workday at 8:00 am and intends to work for 4 hours, but is interrupted at 9:30 am when aliens attack. How much more money would Rose make if she were able to work her full 4-hour shift?



**Middle School:**

*Question:* Mickey the mechanic can replace the tires on a car in 20 minutes. His friend Noel can replace the tires on a car in 25 minutes. If they work together and only one person can work on a tire at a time, how long will it take them to replace all 4 tires on a car?

**Algebra and Up:**

*Question:* The planet Gallifrey has a radius of 3000 kilometres. The planet Skaro has a radius of 4000 kilometres. How many cubic kilometres greater is the volume of Skaro than the volume of Gallifrey? Round pi to 3.14 and your answer to the nearest cubic kilometre.

**Lower Elementary:**

*Question:* The year is 2018. A time traveler transports himself 40 years back in time, then 20 years forward in time, then 34 years back in time. What year is it for the time traveler now?

*Answer:* 1964

*Solution:* Forty years before 2018 is 2018 – 40 = 1978. Twenty years after that is 1978 + 20 = 1998. Thirty-four years before that is 1998 – 34 = 1964. So, it is 1964 for the time traveler when he stops traveling through time.

**Upper Elementary:**

*Question:* Rose works for Henrik’s department store where she makes $9.00 per hour. She begins her workday at 8:00 am and intends to work for 4 hours, but is interrupted at 9:30 am when aliens attack. How much more money would Rose make if she were able to work her full 4-hour shift?

*Answer:* $22.50

*Solution:* Rose works for 11/2 hours from 8:00 am to 9:30 am instead of the 4 hours she intends to work. So, she misses 4 – 11/2 = 21/2 hours. In 21/2 hours, she would have made 21/2 × $9.00 = $22.50.



**Middle School:**

*Question:* Mickey the mechanic can replace the tires on a car in 20 minutes. His friend Noel can replace the tires on a car in 25 minutes. If they work together and only one person can work on a tire at a time, how long will it take them to replace all 4 tires on a car?

*Answer:* Either 121/2 or 12 minutes, depending on how you solve the problem

*Solution:* There are two ways to solve this problem. First, Mickey and Noel can each replace half of the wheels. Mickey can replace 4 wheels in 20 minutes, so he can replace 2 wheels in 10 minutes. Noel can replace 4 wheels in 25 minutes, so he can replace 2 wheels in 121/2 minutes. If they work at the same time, they’ll be done in 121/2 minutes. Alternatively, we can find out how long it would take them if Mickey takes over for Noel after 10 minutes, at which point Noel will be 10 ÷ 121/2 = 4/5 done with his half of the tires. Since Mickey can finish 2 tires in 10 minutes, he can finish the remaining 1/5 of Noel’s work in 1/5 × 10 = 2 minutes. So, if Mickey takes over, they can get the job done in 12 minutes.

**Algebra and Up:**

*Question:* The planet Gallifrey has a radius of 3000 kilometres. The planet Skaro has a radius of 4000 kilometres. How many cubic kilometres greater is the volume of Skaro than the volume of Gallifrey? Round pi to 3.14 and your answer to the nearest cubic kilometre.

*Answer:* 154,906,666,666 miles3

*Solution:* We use the formula 4/3π***r***3 to find the volume of each planet. Skaro’s volume is approximately 267 946 666 666 km3, and Gallifrey’s volume is 113 040 000 000 km3. The difference is therefore 154 906 666 666 km3.