

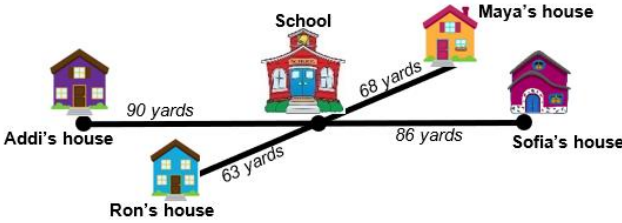



# Math Challenge #8



## Transportation

**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.	 <p>Order the houses from the closest to the farthest from school.</p>	<p><i>Ron's, Maya's, Sofia's, Addi's</i></p>	
2.	<p>Sam is biking from his house to his grandma's house. After biking for 4 miles, he takes a short break. Then, he bikes another 5 miles. If he still has 3 miles left to reach his grandma's house, what is the total distance from Sam's house to his grandma's house?</p> <p><math>4+5+3 = \mathbf{12 \text{ miles}}</math></p>	<p><i>12 [miles]</i></p>	
3.	<p>A school bus has a driver and 6 students. At each stop, 2 more students get on the bus. How many people are on the bus after 3 stops?</p> <p>At the beginning, there are 6+1 or 7 people on the bus. After 3 stops, there are <math>7 + 2 + 2 + 2 = \mathbf{13}</math> people on the bus.</p>		<p><i>13 [people]</i></p>
4.	<p><math>3+4+3+4 = \mathbf{14 \text{ miles}}</math></p>	<p><i>14 [miles]</i></p>	
5.	<p>We can count up for every 30 minutes:            7:00 AM, 7:30 AM, 8:00 AM, 8:30 AM, 9:00 AM.  <math>1^{st}</math>      <math>2^{nd}</math>      <math>3^{rd}</math>      <math>4^{th}</math>      <math>5^{th}</math></p>	<p><i>9:00 AM or 9 AM</i></p>	
6.	 <p>If there are 20 people, they will need <math>20 \div 5</math> or 4 cars. The additional 3 people will need an extra car. So, the total number of cars needed is <math>4 + 1 = \mathbf{5 \text{ cars}}</math>.</p>	<p><i>5 [cars]</i></p>	
7.	<p>If he walks 3 times, he will cover 1 mile. Since he walks 6 times, he covers 2 miles. In the afternoon, he walks <math>\frac{1}{3} + \frac{1}{3} + \frac{1}{3} + \frac{1}{3} = 1\frac{1}{3}</math> miles. In total, 2 miles + <math>1\frac{1}{3}</math> miles = <math>\mathbf{3\frac{1}{3} \text{ miles}}</math>.</p>	<p><i><math>3\frac{1}{3}</math> [miles] or <math>\frac{10}{3}</math> [miles]</i></p>	
8.	 <p>The bus schedule will look like:            6:00 AM, 6:15 AM, 6:30 AM, 6:45 AM, 7:00 AM, 7:15 AM, 7:30 AM, 7:45 AM,            8:00 AM, 8:15 AM            If you arrive at 8:12 AM, you will have to wait <b>3 minutes</b> for the 8:15 AM bus.</p>	<p><i>3 [minutes]</i></p>	
9.	<p>Sarah walks <math>\frac{3}{4}</math> of the way, so: <math>\frac{3}{4} \times 2 \text{ miles} = 1\frac{1}{2}</math> miles or 1.5 miles.            She walks back home: 1.5 miles. She then walks the full distance, which is 2 miles.            Total distance: 1.5 miles + 1.5 miles + 2 miles = <b>5 miles</b>.</p>	<p><i>5 [miles]</i></p>	

10.	When half-full, each car has $58 \div 2 = 29$ passengers. If there are 3 cars that are half-full, there will be $3 \times 29 = \mathbf{87}$ passengers on the train.		87 [passengers]
11.	 <p>A full tank holds 15 gallons, so a half-full tank would hold: <math>15 \div 2 = 7.5</math> gallons.  The total distance on a half-full tank is <math>25 \times 7.5</math> gallons = <b>187.5 miles</b>.  Another way: Total distance the car can go on a full tank: <math>25 \times 15</math> gallons = 375 miles  So, on a half full tank, the car can go: <math>375 \div 2 = \mathbf{187.5}</math> miles.</p>	187.5 [miles]	
12.	 <p>The distance Leilani bikes after 2 hours: <math>10 \text{ miles/hour} \times 2 \text{ hours} = 20</math> miles.  The distance Olivia bikes after 2 hours: <math>12 \text{ miles/hour} \times 2 \text{ hours} = 24</math> miles.  Olivia will be <b>4 miles</b> ahead of Leilani.</p>	4 [miles]	
13.	There are 31 rows in total, 8 rows have 4 seats and 23 rows have 6 seats. $23 \times 6 + 8 \times 4 = 138 + 32 = \mathbf{170}$ seats	170 [seats]	
14.	<p>a. If you catch a bus on the A Line at 10:00 AM from Station X, when will you reach Station Y? <b>10:35 AM</b></p> <p>b. If you catch a bus on the A Line at 10:00 AM from Station X, how long will you have to wait at Station Y to catch a bus on the B Line, and when will you arrive at Station Z? B Line buses depart Station Y every 30 minutes: 10:30 AM, 11:00 AM, 11:30 AM, etc. Since you arrive at 10:35 AM, you will have to wait <b>25 minutes</b> until the next bus, which will leave at 11:00 AM. You will then arrive at Station Z at <b>11:40 AM</b>.</p>	<p>a. 10:35 AM</p> <p>b. 25 minutes to wait, 11:40 AM</p>	
15.	For the first 10 miles, she did 12 miles per hour. It took her: $10 \div 12 = 5/6$ hours or 50 min. Ella still has $30 - 10 = 20$ miles left to bike. She bikes at 8 mph, so it took her: $20 \div 8 = 2 \frac{1}{2}$ hours. The time it takes her to complete her trip: 50 min + 2 hour 30 min = <b>3 hours 20 minutes</b> .	3 hours 20 minutes	
16.	<p>a. If both buses leave the station together at 9:00 AM, what time will they next leave the station together again?  We can find their least common multiple first: LCM of 12 and 18 is 36.  So, both buses will leave the station together every 36 minutes. The next time they will leave together is at <b>9:36 AM</b>.</p> <p>b. How many times, from 8:00 AM to 11:00 AM, will both buses depart at the same time, considering that both will leave the station at 9:00 AM?  8:24 AM, 9:00 AM, 9:36 AM, 10:12 AM, 10:48 AM -&gt; <b>5 times</b></p>	<p>a. 9:36 AM</p> <p>b. 5 times</p>	
17.	Time without stops: $150 \text{ miles} \div 50 \text{ miles/hour} = 3$ hours. The number of stops it makes: 4 stops, because the 5 <sup>th</sup> stop happens at the destination, City B. The total time for the 4 stops is 40 minutes. So, the total trip is 3 hours and 40 minutes. Therefore, the bus reach City B at <b>10:40 AM</b> .	10:40 AM	
18.	For the first 3 hours: $550 \text{ mph} \times 3 \text{ hours} = 1650$ miles. The plane travels 1650 miles in the first 3 hours. The number of miles left to travel after 3 hours: $2450 - 1650 = 800$ miles. Time it will take the plane to reach Los Angeles after slowing down: $800/465 = 1.72$ hours (about <b>1 hour and 43 minutes</b> ).	1 hour and 43 minutes	

Solution is available on January 24, 2025  
[www.mathinaction.org](http://www.mathinaction.org)