

# Math Challenge #10









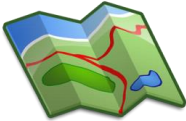
First Name: _____	Last Name: _____	Grade: _____
Teacher: _____	Parent's email: _____	

## Measuring Distance

Welcome to Math Challenge #10. In this challenge, we will be working on solving problems involving distance. Early on in school, we get to practice measuring by laying the unit of measurement end to end. Later, we learn the different standard units used to measure length. Distance measures length. For example, the distance of a road is how long the road is. In the metric system of measurement, the most common units of distance are millimeters, centimeters, meters, and kilometers. In the standard system of measurement, we use inches, feet, and miles.

**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.**

	<i>Answer</i>				
1. Mia's pencil is 2 centimeters shorter than Lara's pencil. If Lara's pencil is 5 cm long, how long is Mia's pencil in centimeters?	<i>3 cm</i>				
2.  Tina's ruler broke in half, right in the middle. It was 12 inches before it broke. How long is the length of one of the broken pieces?	<i>6 inches</i>				
3. Bill is 40 inches tall. His brother, Niel, is 2 inches shorter. His sister, Tamar, is 5 inches shorter than Niel. How tall is Tamar?	<i>33 inches</i>				
4.  There are 5 lamp posts along Redmond street. The lamp posts are 3 meters apart from each other. How long is the distance from the first lamp to the fifth lamp?  There are 4 intervals: $3 + 3 + 3 + 3 = 12 \text{ m}$ or $3 \times 4 = 12 \text{ m}$	<i>12 meters</i>				
5. Trevor drove from town C to town B, then to town A. He had a meeting at town A, then he drove back to town B. What was the total distance Trevor travelled in miles?  Total distance travelled: $19 + 23 + 23 = 65 \text{ miles}$ .	<i>65 miles</i>				
6. Ron had 54 m of ribbon. After he made flowers with the ribbons, 29 m was left unused. How much ribbon, in centimeters, was used to make flowers? $1 \text{ m} = 100 \text{ cm}$ $54 \text{ m} - 29 \text{ m} = 25 \text{ m} = 2500 \text{ cm}$	<i>2500 cm</i>				
7. Dave and Joy go to the same school. The total distance from Dave's house to the school and from Joy's house to the school is 80 yards. If the distance from Dave's house to the school is shorter by 8 yards as compared to the distance from Joy's house to the school, find the distance from Dave's house to their school. Distance from Dave's house to school d <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>d</td></tr><tr><td>d + 8</td></tr></table> } 80 yds $d + d + 8 = 80,$ Distance from Joy's house to school is d+8 <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>d</td><td>8</td></tr></table> } $2d = 72, d = 36 \text{ yds}$	d	d + 8	d	8	<i>36 yards</i>
d					
d + 8					
d	8				

<p>8. Towns Q, R and S are located along the same road in the given order. Town Q and town R are 4.5 km apart. Town R and town S are 3.25 km apart. Raina drove from town S to town R, then to town Q. Finally, she drove back to town R. What was the total distance Raina travelled in kilometers?</p> <p><math>3.25 \text{ km} + 4.5 \text{ km} + 4.5 \text{ km} = 12.25 \text{ km}</math></p>	<p><i>12.25 km</i></p>
<p>9. Tim lines up 3 logs. The first log and the second log have a total length of 8 feet 9 inches. The second log and the third log have a total length of 8 feet 4 inches. If the third log is 4 feet 6 inches long, what is the length of the first log? <math>1 \text{ ft.} = 12 \text{ in.}</math></p> <p>Work backwards:  <math>2\text{nd} + 3\text{rd logs} = 8 \text{ ft } 4 \text{ in} \rightarrow 2\text{nd log} = 8 \text{ ft } 4 \text{ in} - 4 \text{ ft } 6 \text{ in} = 3 \text{ ft } 10 \text{ in}</math>  <math>1\text{st} + 2\text{nd log} = 8 \text{ ft } 9 \text{ in} \rightarrow 1\text{st log} = 8 \text{ ft } 9 \text{ in} - 3 \text{ ft } 10 \text{ in} = 4 \text{ ft } 11 \text{ in}</math></p>	<p><i>4 feet 11 inches</i></p>
<p>10. The length of the yellow ribbon is twice as long as the pink ribbon. The blue ribbon is three times as long as the pink ribbon. If the total length of the three ribbons is 324 centimeters, what is the length (in meters) of the yellow ribbon? <math>1 \text{ m} = 100 \text{ cm}</math></p> <div style="display: flex; align-items: flex-start;"> <div style="margin-right: 20px;"> <p>Yellow </p> <p>Pink </p> <p>Blue </p> </div> <div> <p>All 6 units = 324 cm.  Each unit = <math>324 \div 6 = 54 \text{ cm}</math>  Yellow ribbon = 2 units = <math>2 \times 54 = 108 \text{ cm} = 1 \text{ m } 8 \text{ cm} = 1.08 \text{ m}</math></p> </div> </div>	<p><i>1.08 m</i></p>
<p>11. As shown in the picture, the distance between bus stops B and C is three times the distance between bus stops A and B. The distance between bus stops B and C is 504 yards. What is the distance between bus stops A and C?</p> <div style="text-align: center;">  </div> <p>B to C has 3 equal parts = 504 yards.  A to B has 1 part = <math>504 \div 3 = 168 \text{ yards}</math>. A to C is <math>168 \times 4 = 672 \text{ yards}</math>.</p>	<p><i>672 yards</i></p>
<p>12. On a house plan diagram, 1 inch represents 4 feet. How long is the side of a building that is <math>6 \frac{1}{4}</math> inches long on the diagram?</p> <p>1 inch <math>\rightarrow</math> 4 feet  <math>\frac{1}{4}</math> inch <math>\rightarrow</math> 1 foot  So, <math>6 \frac{1}{4}</math> inches <math>\rightarrow 6 \times 4 + 1 = 25 \text{ ft.}</math></p>	<div style="text-align: center;">  </div> <p><i>25 ft.</i></p>
<p>13. A farm has a rectangular field. The width of the field is 32 yards long. The area of the farm is 2,048 square yards. If farmer Kilstrom plans to fence the field, how much fencing is needed to surround the whole field?</p> <p>The length of the farm: <math>2048/32 = 64 \text{ yards}</math>  The perimeter of the field: <math>64+32+64+32=192 \text{ yards}</math>.</p>	<p><i>192 yards</i></p>
<p>14. Ella estimates the distance between two cities on a map using her thumb from knuckle to thumb tip. The distance is 7 thumb units. Pete uses his thumb to measure the same distance and comes up with 6 thumb units. Ella's thumb unit measures 15 miles. What does Pete's thumb unit measure?</p> <p>Distance of the two cities = <math>7 \times 15 = 105 \text{ miles}</math>.  Pete's thumb unit measures: <math>105\text{mi} \div 6 = 17.5 \text{ miles}</math>.</p>	<div style="text-align: center;">  </div> <p><i>17.5 miles</i></p>
<p>15. Tristan wants to plant trees evenly spaced along the sides of his rectangular plot of land measuring 55 yards by 30 yards. Each tree is planted 5 yards from the next. How many trees can he plant?</p> <p>Perimeter is <math>2(55+30) = 170</math>  <math>170 \div 5 = 34 \text{ trees}</math></p>	<p><i>34 trees</i></p>

16.	<p>Electric poles are placed 50 meters apart along a highway. If Harry drives past 24 poles in one minute as he travels along the highway, what is his slowest average speed could be in kilometers per hour? The distance from the first pole to the twenty-fourth pole is <math>50 \times 23 = 1150</math> meters. His speed must be 1150 meters per minute or 1.150 km per 1 minute</p> <p><math>1.150 \text{ km} \times 60 \text{ minutes} = 69 \text{ km/hr.}</math></p>	<i>69 km/h</i>
17.	<p>Town X and Town Y are 825 miles apart. Christen drives from Town X towards Town Y at a constant speed of 65 miles per hour. At the same time, Paul drives from Town Y towards Town X at a constant speed of 75 miles per hour. Find the distance between Christen and Paul after 3 hours?</p> <p>Every hour, Christen and Paul travel <math>65+75 = 140</math> miles  In three hours, they cover <math>140 \times 3 = 420</math> miles  <math>825 - 420 = 405</math> miles left between them after 3 hours driving</p>	<i>405 miles</i>
18.	<p>Annabella is visiting her grandma who resides 295 miles away from her. She started her driving trip at a speed of 65 mph for the first 3 hours. For the rest of the trip, she drove at a speed of 50 mph. How long did she take to complete her trip?</p> <p>For the first 3 hours, she completes <math>65 \text{ mph} \times 3 \text{ hours} = 195</math> miles. She then has <math>295 - 195 = 100</math> miles to go. Since her speed is 50 mph, it will take her <math>100/50 = 2</math> hours to complete the rest of her journey. Total hours: <math>2 + 3 = 5</math> hours.</p>	<i>5 hours</i>

*Solution is available on March 8, 2019 at [www.mathinaction.org](http://www.mathinaction.org)*