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

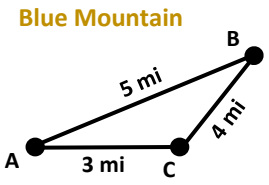
Paths

Welcome to the Math Challenge #9. In this challenge, problems can be solved by making an organized list. For more complex problems, you can think visually and break the problem into smaller components. Enjoy.

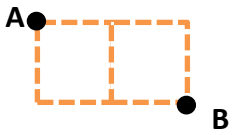
Kinder & First Grade: solve <u>at least</u> 3 problems.
Second & Third Grade: solve <u>at least</u> 7 problems.
Fourth Grade and above: solve <u>at least</u> 12 problems.

Answer

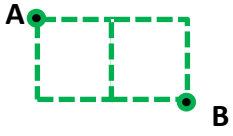
1. Kelly went on a hike at the Blue Mountain. She went from point A to C then to B. She came back down directly from point B to A. What was the total distance of her hike?



2. Anishka would like to get to point B from point A. How many ways are there to get from A to B if she can only stay on the dotted lines and not walk over the same line more than once?



3. The paths from A to B are made by joining 2 squares. If the side of each square measures 6 yards long, how many yards is the shortest path from A to B following the dotted lines?

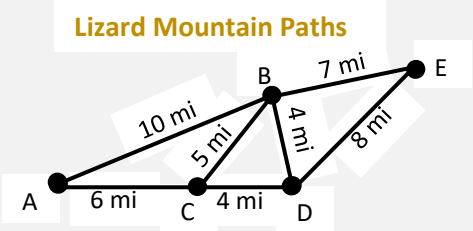


4. Three squares are joined together. The side of each square measures 9 feet long.
   a. What is the shortest path, in feet, you can take from A to B if you follow the dotted lines?
   b. What is the longest path, in feet, you can take from A to B if you follow the dotted lines and you do not walk over the same line more than **once**?

a.

b.

Use this picture to solve problems numbers 5 through 8.



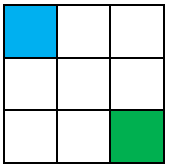
5. Tom plans to bike from point A to point E. What is the shortest distance he can take?

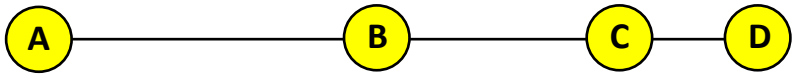
6. What is the longest distance from point A to point E if you are visiting a point not more than once?

7. How many ways are there to get from point A to point E, if you can only visit a point once? (Hint: list all possibilities in an organized way)

8. Maya, on her bike, is leaving Point A and wants to visit points B, C, D, and E, but not necessarily in that order. What is the shortest distance that Maya can take if she has to stay on the paths?

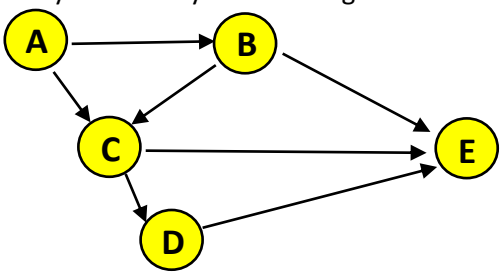
9. Supposed that you want to get from the blue to green square. Each step we may move right or down only. How many distinct paths can you take?



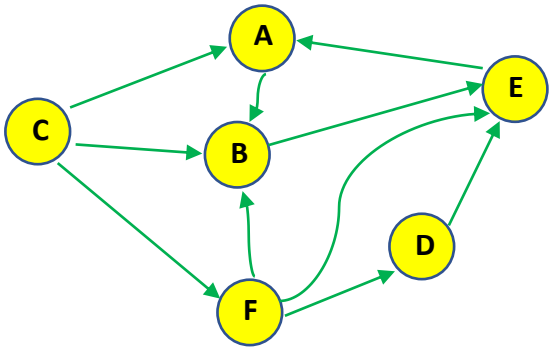
10. 

Town A to town D is 46 miles. Town B to town C is 16 miles. If the distance from town C to town D is half the distance from Town B to C, how many miles is it traveling from Town A to C?

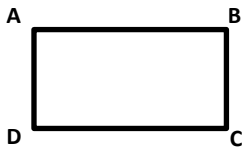
11. How many distinct paths are there from A to E if you can only follow along in the direction of the arrows? Note that you may not visit a point more than once.



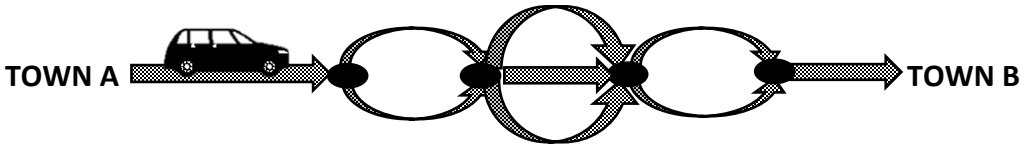
12. If you must follow along the paths of the following diagram in the direction of the arrows, how many paths are there from C to E? Note that you may not visit a point more than once.



13. Ayush walks along the edges of a rectangular pool from point A to B to C to D, a distance of 38 meters. Aaron walks along the edges of the same pool from B to C to D to A, a distance of 31 meters. What is the perimeter of the pool, in meters?

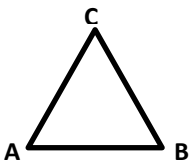


14. To go from Town A to Town B, a car can take different paths illustrated below:

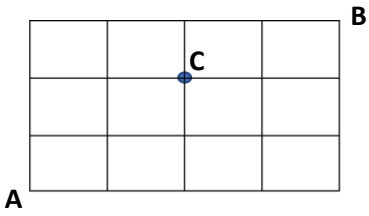


How many different paths can the car go from Town A to Town B if it can only go on one-way roads (indicated by arrows), and it cannot pass any intersection (dot) more than once?

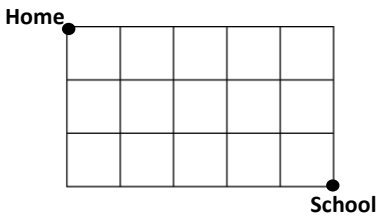
15. Sidhart travels from city A to city B to city C and back to city A. Each city is 120 miles from the other two. His average rate from city A to city B is 60 mph. His average rate from city B to city C is 40 mph. His average rate from city C to city A is 24 mph. What is Sidhart's average rate for the entire trip, in miles per hour?



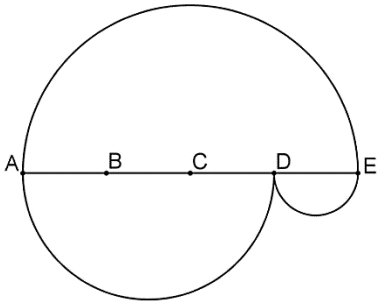
16. How many different paths are there from A to B that go through the point C in the following lattice path? Note that at each point you can **only move up or to the right**.



17. Caitlin's home is three blocks north and five blocks west of her school. How many routes can Caitlin take from home to school if she always travels either south or east?



18. In the diagram, AE is divided into four equal parts. Semicircles have been drawn with AE, AD and DE as diameters. This has created two new paths from A to E, an upper path and a lower path.
Which path is shorter, the upper or the lower? How do you know?



Solution is available on February 19, 2021 at www.mathinaction.org