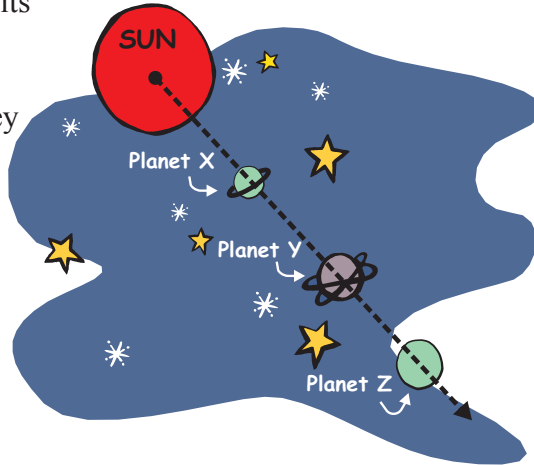


1. A rectangular box has interior dimensions 6-inches by 5-inches by 10-inches. The box is filled with as many solid 3-inch cubes as possible, with all of the cubes entirely inside the rectangular box. What percent of the volume of the box is taken up by the cubes?

1. _____ %

2. Planets X, Y and Z take 360, 450 and 540 days, respectively, to rotate around the same sun. If the three planets are lined up in a ray having the sun as its endpoint, as shown, what is the minimum positive number of days before they are all in the exact same locations again?

2. _____ days



3. In the maze below, you may move only vertically or horizontally to a square with a lesser fraction value. If you start at the indicated square and you keep moving until you are stuck, what fraction is in the last square of your path?

3. _____

	$\frac{29}{3}$	$\frac{10}{3}$	$\frac{36}{11}$	$\frac{19}{6}$	$\frac{9}{2}$
	$\frac{21}{5}$	$\frac{7}{2}$	$\frac{18}{5}$	$\frac{61}{20}$	$\frac{31}{10}$
START →	$\frac{19}{4}$	$\frac{43}{9}$	$\frac{11}{4}$	$\frac{72}{25}$	$\frac{29}{10}$
	$\frac{62}{13}$	$\frac{9}{2}$	$\frac{19}{7}$	$\frac{34}{11}$	$\frac{5}{2}$

4. The speed of a stream is 3 km per hour. A boat travels upstream 12 km and then returns to its original position downstream along the same route. If the speed of the boat in still water is 9 km per hour, what is the average speed of the boat for the entire round trip?

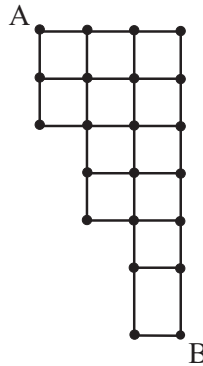
4. _____ kilometers per hour



5. If $x + \frac{1}{y} = 1$ and $y + \frac{1}{z} = 1$, what is the value of the product xyz ?

5. _____

6. If a ladybug walks on the segments of the diagram from point A to point B moving only to the right or downward, how many distinct paths are possible?



6. _____ paths

7. Two angles of a triangle measure 30 and 45 degrees. If the side of the triangle opposite the 30-degree angle measures $6\sqrt{2}$ units, what is the sum of the lengths of the two remaining sides? Express your answer as a decimal to the nearest tenth.

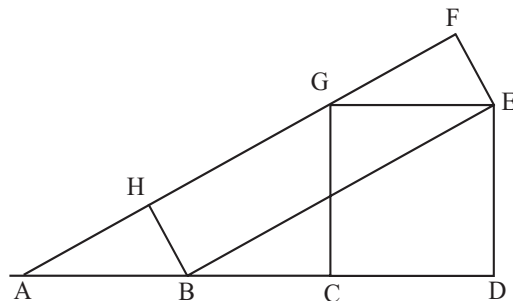
7. _____ units

8. The mean of a set of five positive integers is 1.5 times the median. If three of the integers in the set are 24, 52 and 86, and one of them is the median, what is the sum of all distinct possible sums of the other two integers?

8. _____

9. In the figure below, quadrilateral CDEG is a square with $CD = 3$, and quadrilateral BEFH is a rectangle. If $BE = 5$, how many units is BH ? Express your answer as a mixed number.

9. _____ units



10. Lamant has a box containing only red marbles, blue marbles and green marbles. He needs to select at least 17 marbles without replacement to be sure at least one of them is green. He needs to select at least 18 marbles without replacement to be sure at least 1 of them is red. He needs to select at least 20 marbles without replacement to be sure all three colors appear among the marbles selected. How many marbles are in the box?

10. _____ marbles