

MATHCOUNTS[®] Problem of the Week Archive

National Puppy Day – March 20, 2023

Problems & Solutions

March 23 is National Puppy Day! Solve the problems below about two of the best things, math and puppies.

Rufus the poodle is 1 year old and currently eats 1 dog biscuit per day. Every year, the number of biscuits that he eats doubles. Of course, Rufus is going to eat more as he gets bigger! How many biscuits will Rufus be eating per day when he is 4 years old?

Three years will pass when Rufus turns 4 from 1 year old. In 3 years, the number of biscuits will double 3 times, which means it will increase by a factor of $2 \times 2 \times 2 = 8$. Since he currently eats 1 biscuit, he will eat $1 \times 8 = 8$ biscuits per day when he is 4 years old.

A pit bull can run twice as fast as a chihuahua when going full speed. If a chihuahua can run 45 miles in 3 hours, how many miles can a pit bull run in 4 hours?

If a chihuahua can run 45 miles in 3 hours, it runs at a speed of $45/3 = 15$ mi/h. A pit bull can run twice as fast, or at a speed of $2 \times 15 = 30$ mi/h. Therefore, a pit bull will cover a distance of $30 \times 4 = 120$ miles.

Sandy needs to build a doghouse for his Pomeranian dog. The doghouse is a cube with side length 4 feet, with a square pyramid on top that has height 3 feet. What is the total volume of the doghouse?

The cube has side length 4, which means it has a volume of $4 \times 4 \times 4 = 64$ cubic feet. The pyramid has side length 4 since it rests on top of the cube and a height of 3 feet. Therefore, it has a volume of $(4 \times 4 \times 3)/3 = 16$ cubic feet. The total volume of the doghouse is then $64 + 16 = 80$ cubic feet.

These problems were submitted by a MATHCOUNTS volunteer, Ishir Garg. Thank you, Ishir!

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