

Number Nest Weekly Challenge



Warm up

- What is the answer to $2222 + 222 + 22 + 2$? **2,468**
- Isaac Newton was born on 4th January 1643. How old was he in September 1712? **69 years old.**
- I have been riding my bike for 15 minutes at 12 miles per hour. How many miles have I cycled? **3 miles**
- What is the sum of all the prime numbers between 22 - 65? **$23 + 29 + 31 + 37 + 41 + 43 + 47 + 53 + 59 + 61 = 424$**

Main challenge

- If the digit 4 is replaced by the digit 3 in each of the numbers below, which number is reduced by the largest amount?
A) 45678 B) 87654 C) 95400 D) 74000 E) 99949

A) 45678 because the digit 4 represents the greatest number (40000).

- It is well known that the Pobble has no toes, and that the three-toed sloth has 12 toes (3 on each of its 4 feet). A synchronised swimming team is made up of 7 Pobbles and 5 three-toed sloths. What is the mean number of toes per team member?

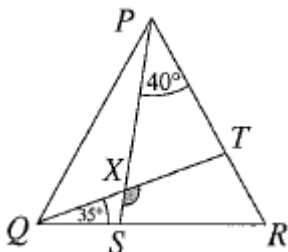
5 Total number of toes in a team is $5 \times 12 = 60$. There are 12 members in the team, so $60/12 = 5$

- If an octopus can open four marmalade jars simultaneously and each jar takes twenty seconds to open, how many jars can the octopus open in two hours?

The octopus can open 12 jars per minute (4×3). In one hour, it can open $12 \times 60 = 720$. Two hours = 1440.

Remember - The mean is an average. To find the mean, add all the numbers together then divide by the number of numbers.

- Triangle PQR is equilateral. Angle SPR = 40° , angle TQR = 35° . What is the size of the marked angle SXT?



Angle PQR is equilateral; hence $\angle PQX = 60^\circ - 35^\circ = 25^\circ$ and $\angle QPS = 60^\circ - 40^\circ = 20^\circ$.

$\angle PXQ = 180^\circ - 25^\circ - 20^\circ = 135^\circ$. Opposite angles are equal therefore $\angle SXT^\circ = 135^\circ$

Bonus

Grandma tells Mabel that her glove drawer contains 1 left-hand blue glove, 2 left-hand green gloves, 3 right-hand blue gloves, and 4 right-hand green gloves, and asks her to bring a pair of gloves from the drawer. Unfortunately, Mabel cannot tell the difference between left-hand and right-hand gloves, but, thankfully, can identify blue and green. What is the smallest number of gloves that Mabel should bring, in order to be sure that these include a matching pair?

4 gloves

If Mabel brings two green gloves they will not necessarily be a matching pair since they could both be left-hand gloves or both be right-hand gloves and, similarly, two blue gloves could be both right-hand gloves. In the same way, three blue (or green) gloves could all be right-handed. However, if Mabel brings all four blue gloves these will include a matching pair.