school nova™

1. y is proportional to x. Given that $y = 144$ when $x = 12$, find the value of y when $x = 7$.

2. Prove that if the sum of the first and last digits of a three-digit number is equal to the second digit, the number is divisible by 11. (If $\overline{abc}$ is a three digit number, a, b, c are digits, and $a + c = b$, the number $\overline{abc}$ is divisible by 11. For example, numbber 352 is divisible by 11, $352 : 11 = 32,\quad 3 + 2 = 5$) Hint: whrite the number in the extended form. We will dicuss this problem in class.

3. Cities A, B, and C, together with the straight roads connecting them, form a triangle. It is known that the direct route from A to B is 200 km shorter than the detour through C, and the direct route from A to C is 300 km shorter than the detour through B. Find the distance between cities B and C.

4. Both sides of the rectangle are increased by 10%. By what percent did its area increase?

5. I reduced the speed of my car by 20% when I drove to work today due to bad weather. By what percent will my travel time increase?

6. The sum of two numbers is 51. What are these numbers if 30% of one number equals 60% of the other number?

7. A swimming pool can be filed by one pipe in 10 hours or by second pipe in 15 hours. For 2.5 hours the pool was being filed by the firs pipe, then the second pipe was open. In how many hours after the opening of the second pipe the swimming pool will be filed up? Will be filed up by $\frac{3}{4}$?

8. What would be the last digit of the value of the expression:
$$94^6 + 76^6 + 51^6$$