

1. What should be the exponent for the equation to hold?

a.  $8^* = 512$ ;    b.  $2^* = 64$ ;    c.  $3^* = 81$ ;    d.  $7^* = 343$

2. What digits should be put instead of \* to get true equality? How many solutions does each problem have?

a.  $(2 *)^2 = ** 1$ ;    b.  $(3 *)^2 = *** 6$   
c.  $(7 *)^2 = *** 5$     d.  $(2 *)^2 = ** 9$ ,    e.  $(3 *)^2 = ** 1$

3. In a magical lake, the number of water lilies doubles every night. On March 1st, the magician planted the first lily, and in 90 nights, the entire lake was covered with lilies. On which day was only half of the lake covered?



4. Reduce the fractions

a.  $\frac{49^4 \cdot 7^5}{7^{12}}$ ;    b.  $\frac{3^{10} \cdot 27}{81^3}$ ;    c.  $\frac{125^3 \cdot 5^7}{5^{18}}$ ;

5. Houses of Winnie the Pooh and Piglet are on the same street, 600 meters apart. At the same time, they started moving in opposite directions. Pooh was walking with a speed of 3 km/h, and Piglet was running with a speed of 6 km/h. How far from each other will they be in 20 minutes?

6. The cats of the Siberian, Angora, Persian, and Siamese breeds were presented at the cat exhibition. Siamese cats were twice as many as Angora cats, Persian cats were 1.5 times more than Siamese cats, and Siberian cats were 13 fewer than Persian cats. How many cats of each breed were there if there were 77 cats in total?

7. Evaluate by convenient way (use the distributive property):

a.  $17 \cdot 34 + 26 \cdot 17 + 13 \cdot 60$ ;    b.  $4 \cdot 45 + 4 \cdot 55 + 6 \cdot 55 + 6 \cdot 45$ ;