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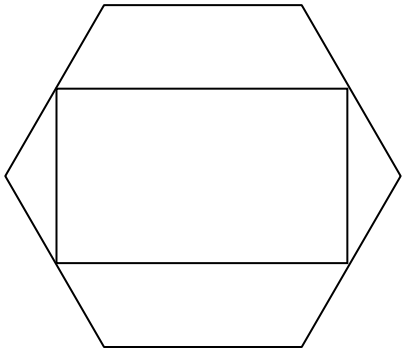
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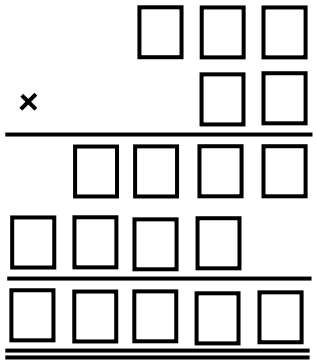
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Individual Questions

1. A regular hexagon is given. The vertices of the rectangle lie on the midpoints of the sides of the hexagon. What is the ratio of the area of the rectangle to the area of the hexagon?



2. A multiplication of a three-digit number by a two-digit number has the form as shown below. Using only the digits 2, 3, 5 or 7, fill in all boxes to complete the correct multiplication.



3. How many different ways are there to form a three-digit **even** number choosing the digits from 0, 1, 2, 3, 4 or 5 without repetition?

4. For how many whole numbers between 100 and 999 does the product of the ones digit and tens digit equal the hundreds digit?
5. In a survey of 100 persons, it was found that 28 read magazine A, 30 read magazine B, 42 read magazine C, 8 read magazines A and B, 10 read magazines A and C, 5 read magazines B and C and 3 read all three magazines. How many people do not read any of these magazines?
6. A school has to buy at least 111 pens. The pens are sold in packs of 5 which cost \$6 per pack or packs of 7 which cost \$7 per pack. What is the lowest cost at which the school can buy the pens?
7. How many digits does the product $25^{16} \times 2^{38}$ have?

8. On a wooden rod, there are markings for three different scales. The first set of markings divides the rod into 10 equal parts; the second set of markings divides the rod into 12 equal parts; the third set of markings divides the rod into 15 equal parts. If one cuts the rod at each marking, how many pieces does one get?
9. There are ten identical candies in a jar. Albert can only eat 1 or 2 of these candies at a time. He does this until there is no more candy left. In how many different ways can he do this?
10. The entrance fee to a museum is \$5 per adult and \$4 per child. For any group of five people, the entrance fee is \$19. Two adults who pay the full entrance fee may take a child for free. Three adults and fourteen children come to visit the museum. What is the least amount they need to spend on the entrance fee?
11. A, B, C, D, $A+C$, $B+C$, $A+D$, $B+D$ represent the eight different natural numbers 1 to 8. If A is the largest number amongst A, B, C and D, what is A?
12. A nine-digit number $\overline{abcdefghi}$ is such that its digits are all distinct and non-zero. The two-digit number $\overline{ab}$ is divisible by 2, the three-digit number $\overline{abc}$ is divisible by 3, the four-digit number $\overline{abcd}$ is divisible by 4, and so on so that the nine-digit number $\overline{abcdefghi}$ is divisible by 9. Find this nine-digit number.
13. In how many ways can seven students A, B, C, D, E, F and G line up in one row if students B and C are always next to each other?
14. A 1001-digit number begins with 6. The number formed by any two adjacent digits is divisible by 17 or 23. Write down the last six digits.
15. The pattern below is formed by drawing semi-circles inside squares. The radii of three types of semi-circles are 4 cm, 2 cm and 1 cm respectively. What is the total area of the shaded regions? (Take $\pi = 3.14$)

