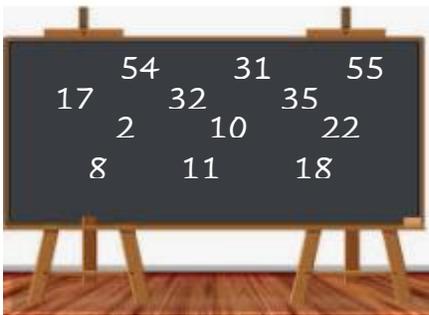


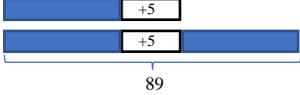


## Mystery and Secret Numbers

**Kinder & First Grade: solve at least 3 problems.**  
**Second & Third Grade: solve at least 7 problems.**  
**Fourth Grade and above: solve at least 12 problems.**

	<i>Answer</i>
1. Xiao's secret number is less than 10 and more than 4. It is an even number that is less than 8. What is his secret number?	6
2. A mystery number is larger than 6 but less than 12. When you count by 3, you will say this number. What is the mystery number?	9
3. Binta's secret number is not an even number. It is between 20 and 50. The sum of its digits is 7. You would say this number when you count by 5. The mystery number is _____.	25
4. This mystery number is an odd number. It is between 315 and 323. The sum of the digits is 6. The mystery number is _____.	321
5. This mystery number is even. It is between 966 and 994. The ones digit and tens digit are the same number. The mystery number is _____.	988
6. This mystery number is a three-digit odd number. All the digits are the same. The product of the digits is 27. The mystery number is _____.	333
7. <b>Less than 50</b> a. This mystery number is less than 50. When divided by 5, the remainder is 1. When divided by 8, the remainder is 2. The mystery number is _____. b. This mystery number is less than 50. When divided by 3, the remainder is 2. When divided by 4, the remainder is 1. When divided by 5, the remainder is 4. The mystery number is _____.	a. 26 b. 29
8.  You will find this mystery number if you follow the clues. <ul style="list-style-type: none"> <li>• Cross out all numbers that are multiples of 7.</li> <li>• The mystery number is not divisible by 5.</li> <li>• Cross out all numbers that are multiples of 6.</li> <li>• The mystery number is not a prime.</li> <li>• Cross out all numbers with a factor of 4.</li> </ul> The mystery number is _____.	22

<b>9.</b>	<p><b>Three-digit numbers</b></p> <p>a. This mystery number is a three-digit even number. The tens digit is greater than the number of quarts in a gallon. The ones digit is greater than the tens digit. Both the hundreds digit and the tens digit are odd numbers. The ones digit is less than the number of sides of an octagon. The tens digit is less than the ones digit. The hundreds digit is less than the number of cents in a nickel and it is not the smallest odd number. This mystery number is _____.</p> <p>b. This mystery number is a three-digit odd number. All digits are odd numbers. The tens digit is greater than the number of items in a half-dozen. The hundred digit is greater than the tens digit. The ones digit is greater than the number of quarters in a dollar. The ones digit is smaller than the tens digit. This mystery number is _____.</p>	<p>a. 356</p> <p>b. 975</p>
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<b>10.</b>	<p>I am thinking of a mystery number. If you add 5 to this number you will get the same answer as when you subtract the mystery number from 89. What is the number?</p> <p>Draw a model for this problem:</p>  <p style="margin-left: 100px;"><math>89 = 2 \text{ identical numbers} + 5</math>  <math>89 \div 2 = 42 \text{ (mystery number)}</math>  Check: <math>42 + 5 = 89 - 42</math></p>	42
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<b>11.</b>	<p><b>Four-digit numbers</b></p> <p>a. This mystery number is a four-digit number. The ones digit is a 4. The thousands digit is twice the value of the ones digit. The hundreds digit is one less than the thousands digit. The sum of all digits is 25. The mystery number is _____.</p> <p>b. This mystery number is a four-digit number. The thousands digit is even and is a multiple of 3. The ones digit is also even and 1 less than the tens digit. The hundreds digit is three more than the thousands digit. The sum of all digits is 32. The mystery number is _____.</p>	<p>a. 8764</p> <p>b. 6998</p>
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<b>12.</b>	<p>Find the following mystery number using the following clues:</p> <ul style="list-style-type: none"> <li>• The number is a four-digit even number.</li> <li>• All digits are different.</li> <li>• The sum of all the digits is 10, and each of the digits is greater than zero.</li> <li>• The sum of the digits in the thousands place and hundreds place equals the sum of the digits in the ones place and tens place.</li> <li>• The largest digit is in the thousands place.</li> </ul> <p>Start with the third clue (the sum of all the digits is 10). Possible digits: 1, 2, 3, 4. Since the largest digit is in the thousands place, the first digit must be 4. It means the thousands + hundreds place add up to 5, tens and ones place add up to 5.</p> <p>The sum of the digits in the thousands place and hundreds place equals the sum of the digits in the ones place and tens place. Therefore, 4132 is the mystery number.</p>	4132
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<b>13.</b>	<p>The password to a locker is a 5-digit number. These are the clues:</p> <ul style="list-style-type: none"> <li>• The 4th digit is 4 more than the 2nd one.</li> <li>• The 3rd digit is 3 less than the 2nd one.</li> <li>• The 1st digit is three times the 5th digit.</li> <li>• The sum of 1<sup>st</sup> and 2<sup>nd</sup> digits is 11; the sum of 3<sup>rd</sup> and 4<sup>th</sup> digits is 11, the sum of 4<sup>th</sup> and 5<sup>th</sup> digits is 11.</li> </ul> <p>Find the password.</p> <p>1. The password is a 5-digit number. _ _ _ _ _</p> <p>2. The 4th digit is 4 more than the 2nd one. _ 5 _ _ 9 _ (Four more than 5 is 9, it may also be 1&amp;4, 2&amp;6, ect. but the best answer would be 5 and 9 &lt;after reading clue #3 and clue #5&gt;)</p> <p>3. The 3rd digit is 3 less than the 2nd one. _ 5 2 9 _ (2 is 3 less than 5 which is 4 more than 9)</p> <p>4. The 1st digit is three times the 5th digit. 6 5 2 9 2 (6 is three times 2)</p> <p>5. Three pairs of digits sum up to 11. 1st pair: 6+5=11; 2nd pair: 9+2(3rd number) =11; 3rd pair: 9+2(5th number) =11.</p>	65292
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<p>14. Guess the 5-digit mystery number using the following clues:</p> <ul style="list-style-type: none"> <li>• The number is divisible by 2.</li> <li>• The average of all numbers is 5.</li> <li>• The last two digits are divisible by 7 and together the number formed by last 2 digits is less than 70.</li> <li>• The number is less than 50000, and the middle digit is 7.</li> <li>• The first 2 digits are divisible by 11.</li> <li>• There is only 1 odd digit.</li> </ul> <p>From clue 4 and 5, we have 22 and 44 as possible first two digits.  From clue 3 and 6, we have 28, 42 and 56 as possible last two digits.  The average of the number is 5. We can do trial and error on 22728, 44728, 22742, 44742, 22756, and 44756. Since <math>4+4+7+2+8 = 25/5 = 5</math>, the mystery number must be 44728.</p>	<p>44728</p>
<p>15. Find out a 5-digit mystery number that fits all the conditions below:</p> <ul style="list-style-type: none"> <li>• The sum of all five digits is 23.</li> <li>• The second digit is 3 times the first digit.</li> <li>• The third digit is 2 smaller than the first digit.</li> <li>• The fourth digit is 5 greater than the first digit.</li> <li>• The last digit is 4 times the first digit.</li> </ul> <p>Take the first digit as one unit. Then, 1 unit + 3 units + 1 unit – 2 + 1 unit + 5 + 4 units = 23  So, 1 unit = 2. Then, 3 units = 6  1 unit – 2 = 0; 1 unit + 5 = 7; 4 units = 8  Then, the number is 26,078.</p>	<p>26078</p>
<p>16. Find a six-digit number containing no zeros and no repeated digits that satisfies the following conditions:</p> <ul style="list-style-type: none"> <li>• The first and fourth digits sum to the last digit, as do the third and fifth digits.</li> <li>• The first and second digits when read as a two-digit number equal one quarter the fourth and fifth digits.</li> <li>• The last digit is four times the third digit.</li> </ul> <p>From the last clue, the last digit is either 4 or 8.  From the first clue, we know that the last digit is not 4. Because you can make <math>4 = 1 + 3 = 2 + 2 = 3 + 1</math>, but there are no repeated digits in the number. So, the last digit is 8.  From the second clue we can write possible digits for the 4<sup>th</sup> and 5<sup>th</sup> place that is a multiple of 4, but without identical digits, without zeroes, more than 70. Because if it would be less or equal to 36, then the first two digits will not be possible, as <math>36/4 = 9</math> (one digit only). If it would be less or equal to 68, then the first two digits would be 17, but <math>17\_68\_1 + 6</math> is smaller than 8. Choices for the 4<sup>th</sup> and 5<sup>th</sup> digits are only: 72, 76.  Now let's check the clues one more time.  186728 we have repeated digits, and <b>192768</b> works with all the clues.</p>	<p>192768</p>
<p>17. What is the 5-digit mystery number that fits all the conditions below?</p> <ul style="list-style-type: none"> <li>• the sum of the first two digits is one smaller than the third digit.</li> <li>• the third digit is double the fourth digit.</li> <li>• the fourth digit is double the last digit.</li> <li>• the third digit is the product of the fourth and fifth digits.</li> <li>• the second digit is five more than the first digit.</li> <li>• the first digit is one-eighth of the third digit and also one-fourth of the fourth digit.</li> </ul>	<p>16842</p>

<p>18. What 5-digit number satisfies the following requirements?</p> <ul style="list-style-type: none"><li>• There are no zeroes.</li><li>• The first two digits are the same.</li><li>• The fourth digit is twice the first.</li><li>• The last digit is twice the third.</li><li>• The sum of all digits is 18.</li></ul> <p>Reading the third clue we can get that the number starts either on 11, 22, 33, 44. The 4th clue makes the last digit twice as large as the 3rd digit, thus 18 minus the sum of the first two identical digits and the third one must be divisible by 3. It works only for 33264.</p>	<p>33264</p>
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*Solution is available on March 5, 2021 at [www.mathinaction.org](http://www.mathinaction.org)*