



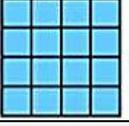
Palindrome

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.



Answer

1.	I am a two-digit number and I am less than 20. I am also a palindrome. What number am I?	11
2.	I am the largest two-digit number and I am a palindrome. What number am I?	99
3.	Write two words that are palindromes. For examples, madam, noon, and dad.	<i>Varies.</i> <i>(bib, did, mom, eye, radar, racecar, wow, kayak, refer, etc.)</i>
4.	I am an odd number and I am a palindrome. I am greater than eleven and less than fifty. What number am I?	33
5.	How many 2-digit palindromes are there? <i>There are 9 palindromes with two digits (11,22,33, ...,99).</i>	9
6.	I am a three-digit number and I am a palindrome. I am less than 500. I am greater than 200. All my digits are odd. The sum of my digits equals 7. What number am I?	313
7.	I am a four-digit number. I have a one in my thousands place, and a five in my hundreds place. I am a palindrome. What number am I?	1551
8.	I am a palindrome. I am greater than the number of days in a year and less than the product of 19 and 20. What number am I?	373
9.	A car's odometer shows 15951 miles, a palindromic number. What is the minimum number of miles you would need to travel to form the next palindrome? <i>110 miles (when the odometer shows 16061): $15951+110 = 16061$</i>	110 miles
10.	I'm a seven-digit number, and I am a palindrome. Five of my digits are zeros. I am the greatest number possible with those characteristics. What number am I? <i>Think: _00000_. Since we want to form the greatest number, we can place the digit 9 on the first and the last digit.</i>	9000009
11.	I am a prime and a palindrome. I am larger than 15 and less than 130. What number am I? <i>We can rule out all the two-digit numbers that are palindromes (22, 33, 44, ...) since all of them are not primes. Then, we have 101, 111, 121. $111 = 3 \times 37$, $121 = 11 \times 11$. The answer is 101 since 101 is the only 3-digit palindrome prime number that is less than 130.</i>	101
12.	Let's look at the number 5346. a. Find the first number greater than 5346 that is a palindrome. b. Find the closest number to 5346 that is a palindrome.	a. 5445 b. 5335

<p>13.  $1 \times 1 = 1$</p> <p> $2 \times 2 = 4$</p> <p> $3 \times 3 = 9$</p> <p> $4 \times 4 = 16$</p>	<p>A square number is the result of multiplying an integer by itself. For example, $4 \times 4 = 16$, so 16 is a square number.</p> <p>Name all square numbers between 100 to 1,000 that are also palindromes. $11 \times 11 = 121$, $22 \times 22 = 484$, and $26 \times 26 = 676$</p>	<p><i>121, 484, 676</i></p>
<p>14. How many palindromes are there between 5000 and 5999? <i>5005, 5115, 5225, 5335, 5445, 5555, 5665, 5775, 5885, 5995.</i></p>		<p><i>10</i></p>
<p>15. Kiana was looking at her clock and noticed something interesting. The clock was showing 10:01 a.m. which is a palindrome. Her digital clock always displays all 4 digits (2 digits of hours and 2 digits of minutes). She also set her clock using non-military time format. How many times will the clock show a palindrome from 11:00 a.m. until she goes to bed at 10:00 p.m. at night? <i>11:11, 12:21, 01:10, 02:20, 03:30, 04:40: 05:50</i></p> <p>Note: Regular time uses numbers 1 to 12 to identify each of the 24 hours in a day. In military time, the hours are numbered from 00 to 23. Under military time, 1 p.m. is 13, 3 p.m. is 15, and so on, Kiana is using regular time or non-military format.</p>		<p><i>7 [times]</i></p>
<p>16. Two-digit palindromes must have identical digits (11, 22, 33, ...). You have 9 choices for the first digit, and the second digit is determined for each, so you have 9 palindromes between numbers 10-100. How many palindromic numbers are there between 100-1000? <i>Three-digit palindromes must have identical first and last digits, but the middle digit is a free choice. There are 9 choices for the first digit (0 is excluded), and for each choice, there are 10 choices for the middle digit, so the answer is 9×10.</i></p>		<p><i>90</i></p>
<p>17. What is the largest palindrome made from the product of two 2-digit numbers? <i>$9009 = 91 \times 99$.</i></p>		<p><i>9009</i></p>
<p>18. Make all palindromes that fit this six-digit number: 8_3_._. <i>There are ten solutions! They are 803308, 813318, 823328, 833338, 843348, 853358, 863368, 873378, 883388, 893398.</i></p>		<p><i>803308, 813318, 823328, 833338, 843348, 853358, 863368, 873378, 883388, 893398.</i></p>

Solution is available on March 6, 2020 at www.mathinaction.org