Oddball Patterns

Palindromes

Palindromes are digits that are in the same order whether they are read backwards or forwards. Below are some examples of palindromes.

131	111	34543	889988	32123

Directions: Study the Facts and Reminders page for this unit. Use a calculator and pencil and paper to solve these problems. (Some problems will be too large for a calculator.) Look for the pattern in the answers.

1. 121
x 11

2. 151
x 11

3. 242
x 11

4. 171
x 11

5. 181
x 11

6. 232
x 11

7. 545
x 11

8. 353
x 11

9. 2442
x 11

10. 24442
x 11

11. 123321
x 11

12. 123321
x 111

13. 141
x 11

14. 141
x 111

15. 124421
x 11

16. 171
x 111

17. 12344321
x 11

18. 4444
x 11

19. 2222
x 11

20. 123454321
x 11

Extension

In the space below, create some multiplication problems using palindromes which also yield palindromes in the answers.

1.   **2.**   **3.**   **4.**

Which digits seem to work especially well? _____

Try to make palindromes with 3- or 4-digit multipliers.

_____

Oddball Patterns

Unusual Number Patterns

Directions

- Study the Facts and Reminders page for this unit.

- Compute the problems shown here.

- Look for the pattern.

- Try doing some of them in your mind.

- Check your answers with pencil and paper. (The calculator doesn't have enough room for all of the answers.)

1 x 1 = _____

11 x 11 = _____

111 x 111 = _____

1111 x 1111 = _____

11111 x 11111 = _____

111111 x 111111 = _____

1111111 x 1111111 = _____

11111111 x 11111111 = _____

111111111 x 111111111 = _____

1. Describe the pattern. _____
_____

2. Explain why you think it works the way it does. _____
_____

3. How could you predict the product of 111,111,111,111 and 111,111,111,111?
_____

Directions: Use your calculator and pencil and paper to solve these problems. The calculator won't have room to do the longer problems. Look for the pattern.

4. 12,345,679
　　　　x 9
　　_____

5. 12,345,679
　　　　x 18
　　_____

6. 12,345,679
　　　　x 27
　　_____

7. 12,345,679
　　　　x 36
　　_____

8. 12,345,679
　　　　x 45
　　_____

9. 12,345,679
　　　　x 54
　　_____

10. 12,345,679
　　　　x 63
　　_____

11. 12,345,679
　　　　x 72
　　_____

12. 12,345,679
　　　　x 81
　　_____

13. Do the same problems but include the 8 in the multiplicand (upper number). For example, multiply 123,456,789 x 9, etc. Describe what changed in the answer pattern.
_____
_____
_____

Oddball Patterns

Puzzles and Patterns

Directions: Study the Facts and Reminders page from this unit. Try to do the problems below in your mind. Check your answers with a calculator or with pencil and paper.

1. 40	**2.** 41	**3.** 42	**4.** 43
x 40	x 39	x 38	x 37

5. 44	**6.** 45	**7.** 46	**8.** 47
x 36	x 35	x 34	x 33

9. 60	**10.** 61	**11.** 62	**12.** 63
x 60	x 59	x 58	x 57

13. 64	**14.** 65	**15.** 66	**16.** 67
x 56	x 55	x 54	x 53

Directions: Carefully study the palindrome puzzle on the Facts and Reminders page for this unit. Start with any number, and add the reversed digits to the original number. Then reverse the digits and add again. Continue the process until another palindrome is formed. Start with these problems and then do some of your own. The first one has been done for you.

17. 3459
+ 9543
‾‾‾‾‾‾
   13002
+ 20031
‾‾‾‾‾‾
   33033

18. 95413

19. 67124

20. 12345

21.

22.

23.

24.