Daily warm-ups

PRE-ALGEBRA

by Hope Martin

WALCH PUBLISHING
# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>States of the Union</td>
<td>1–35</td>
</tr>
<tr>
<td>Famous Firsts</td>
<td>36–69</td>
</tr>
<tr>
<td>Discoveries, Inventions, and Notable Accomplishments</td>
<td>70–103</td>
</tr>
<tr>
<td>Happy Birthday to You…</td>
<td>104–147</td>
</tr>
<tr>
<td>Historical Highlights</td>
<td>148–180</td>
</tr>
<tr>
<td>Glossary</td>
<td>181–183</td>
</tr>
</tbody>
</table>
States of the Union

The growth of the United States took place over the course of 172 years. Delaware was the first of the colonies to join the Union (December 7, 1787) and Hawaii became the 50th state (August 21, 1959).

The mathematics puzzles in this chapter help celebrate the nation we are today. When students solve the mathematical clues, they learn the year that each state became a part of the United States of America. Interdisciplinary discussions might encourage students to explore the correlation between the dates colonies and territories became states, life in colonial times, pioneer exploration, and the growth of the western part of the United States.
Louisiana became the 18th state of the Union on April 30 of this year. To learn the year that Louisiana became a state, just solve this puzzle.

- The two-digit number formed by tens and units digits could be the perimeter of this rectangle:

```
  Tens
 /     |
/      |
Units
```

- My hundreds digit is 4 times my units digit.
- The three-digit number formed by my thousands, hundreds, and tens digits is a palindrome.

What year am I?

<table>
<thead>
<tr>
<th>Thousands</th>
<th>Hundreds</th>
<th>Tens</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In this year, Florida and Texas became the 27th and 28th states of the United States. Solve this puzzle to learn the year.

- My hundreds digit is 200% of my tens digit.
- The two-digit number formed by my tens and units digits could be the area of this trapezoid:
  \[ \frac{2^3 + 7 \times 4}{2} \]
- The sum of all of my digits is equal to \( \frac{2^3 + 7 \times 4}{2} \).

What year am I?
We are all fascinated by the first of anything—the first person to climb a mountain, the first minority to be elected to office, even the first telephone operator! These puzzles take us back in time to contemplate those explorers, scientists, entrepreneurs, and others who have changed history by being the first of something. By solving these puzzles, students learn the year that the “famous first” occurred.
The first women to become FBI agents completed their training in Quantico, Virginia, in this year. The new agents were Susan Roley and Joanne Pierce. Solve this puzzle to learn the year.

- My odd tens and even units digits are both prime numbers; if they were the sides of a rectangle, its area would be 14.
- The sum of my tens and units digits is equal to my hundreds digit.
- The sum of all of my digits is 1 less than 2 decades.

What year am I?
The first ocean-to-ocean railroad was completed on May 10 of this year. The Union Pacific and Central Pacific railways were linked at Promontory Point, Utah, by a golden spike. Learn the year by solving this puzzle.

- My tens digit is 75% of my hundreds digit.
- My tens digit is $66\frac{2}{3}\%$ of my units digit.
- The sum of all of my digits is equal to $4!$.

What year am I?
Discoveries, Inventions, and Notable Accomplishments

Looking at a time line of the history of humankind, one might consider the changes that have come to pass during the 20th century as nothing less than amazing! My grandmother was born before there were automobiles, my mother was born before there were airplanes, and I was born before there were jet airplanes or men on the moon! In three generations, we have gone from the horse and buggy era to an International Space Station that orbits the earth. This section looks at those discoveries, inventions, and other notable accomplishments that have changed our world. When students solve each puzzle, they learn the year of each of the accomplishments.
On January 5 of this year, German physicist Wilhelm Roentgen announced the discovery of the X ray. Solve this puzzle to learn the year.

- The two-digit number formed by my thousands and hundreds digits is equal to $2 \times \sqrt{81}$.
- The two-digit number formed by my tens and units digits is the product of the third and eighth prime numbers.
- The sum of all of my digits is 2 less than $5^2$.

What year am I?
On December 4 of this year, a painting in the Metropolitan Museum of Art in New York City was found to have been hung upside down. It had been in this embarrassing position for 47 days. Solve this puzzle to learn the year.

• My tens digit is $\frac{2}{3}$ of my hundreds digit.
• Both my thousands and units digits are the multiplicative identity.
• The sum of all of my digits is equal to the seventh prime number.

What year am I?

<table>
<thead>
<tr>
<th>Thousands</th>
<th>Hundreds</th>
<th>Tens</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>
The puzzles in this section all relate to the birthdays of famous (and sometimes not so famous) people. Because many of these people will be familiar to students, they may analyze the clues by focusing on the historical context rather than on the isolated mathematics problem. It is possible you will hear, “That answer doesn’t make sense. This person had to be born in the 1900s!” This is a good thing! When students start to look at mathematics as a “sense-making experience,” they begin to understand the power of mathematics, and they evolve into real problem-solvers.
On May 19 of this year, African-American civil rights leader Malcolm X (Malcolm Little) was born in Omaha, Nebraska. He took the letter “X” to protest the family name assigned by white slave owners to their slaves. He began the Organization of American Unity. He was assassinated in New York City in 1965. Find the year he was born.

• The two-digit number formed by my tens and units digits is equal to $\sqrt{625}$.
• The two-digit number formed by my thousands and hundreds digits is equal to the eighth prime number.
• The sum of all of my digits is equal to 8 more than my hundreds digit.

What year am I?

138

Thousands   Hundreds   Tens   Units

© 2003 J. Weston Walch, Publisher