Lecture Notes

Notes

- Start subtracting from the **ones** column (the right-hand digits) and continue to subtract each column as you move to the left.
- The answer to a subtraction problem is called a **difference**.
- For subtraction, the bigger number *must* go on top.
- Make sure to keep each column vertically aligned as you work out the problem on paper.
- Use plenty of space between each digit to avoid crowding the digits. It will also make it easier to vertically align your digits.
- Using commas are optional. However, if you do use them, they must be placed correctly, or the answer will be considered incorrect.

Subtract.

$$
\begin{array}{r}
87 \\
-42 \\
\hline
\end{array}
$$

- Subtract from right to left.

Subtract.

$$
\begin{array}{r}
348 \\
-236 \\
\hline
\end{array}
$$

- Subtract from right to left.

Find the difference.

$$64 - 24$$

The difference is 40 .

- Change horizontal format to vertical format.
- The left number (the bigger number) must go on top.
- Subtract from right to left.

Find the difference.

936 − 710

The difference is 226 .

Subtract.

```
   87
 − 39
```

- Subtract from right to left.
- We must do a **borrow** since the top digit (**7**) is smaller than the bottom digit (9).
  - We borrow "1" from the top number of the next column to the left so that the 8 becomes 7.
  - The "1" we borrowed goes in front of the **7** in the ones column, so it then becomes **17**.
  - We can now subtract the ones column because the top number (**17**) is bigger than the bottom number (9). And 17 − 9 = 8.
  - We then subtract the digits in the tens column, 7 − 3 = 4.
  - Thus, the answer: 87 − 39 = 48.

```
   787
 − 289
  498
```

- Subtract from right to left.
- Borrow if necessary.

44 − 18

The difference is 26 .

- Change horizontal format to vertical format.
- Subtract from right to left.
- Borrow if necessary.

$$561 - 44$$

The difference is 517 .

- Change horizontal format to vertical format.
- You must right-align the numbers as you change them to vertical format.
- Borrow *only* if necessary, be careful.

$$\begin{array}{r} 9\ 0 \\ -\ 7\ 5 \\ \hline \end{array}$$

The difference is 15 .

- Be careful with 0 – 5 because the answer is not 5.
  - We must borrow since the top digit (**0**) is smaller than the bottom digit (5).
- However, if the numbers were reversed 5 – 0, then the answer would be 5 since the top digit (5) is bigger than the bottom digit (0).
  - In this case, we have 5, we take away nothing (0), so we still have 5 left over (the answer).

Find the difference.

$$\begin{array}{r} 504 \\ -\ 39 \\ \hline \end{array}$$

The difference is 465 .

- We must borrow to subtract the ones column.
- But when we attempt to borrow from the 0, we cannot. The 0 has nothing to give.
- We then move to the next column on the left and we borrow from the 5.
  - The 5 becomes 4.
- The "1" we borrowed from the 5 goes to the next digit to the right, the 0.
  - The "1" goes in front of the 0 to *temporarily* become 10.
- Since there is now a 10 where the 0 use to be, we can borrow from the 10.
  - The 10 becomes 9.
- The "1" we borrowed from the 10 goes to the next digit to the right, the 4.
  - The "1" goes in front of the 4 to become 14.
- Now can we subtract the ones column since the top digit (14) is bigger than the bottom digit (9).
- Continue subtracting the other digits and borrow only if needed.

Subtract.

```
    900
  - 275
  -----

```

The difference is 625 .

- Use the same process as the previous problem.
- Notice the 0 in the tens column ended up as a 9 (after we borrowed "1" from 10).
- However, the 0 in the ones column ended up as a 10, and it stayed as a 10.
  - The reason it stayed as a 10 is because we did not have to borrow from it.
  - There are no other digits to the right to borrow for.

Subtract.

```
   703
 - 277
 -----
```

Find the difference.

$$902 - 163$$

The difference is 739 .

- Change horizontal format to vertical format.