CHAPTER 2
Mental Math and Estimation

Lesson 2.1 Mental Addition

Fill in the blanks. Use number bonds to help you.

Example

27 + 54 = ?

27 + 50 = ______77______

____77____ + _______4____ = ____81____

So, 27 + 54 = ______81____

1. 36 + 57 = ?

36 + 50 = __________

________ + _________ = _________

So, 36 + 57 = _________

2. 19 + 56 = ?

19 + 50 = __________

________ + _________ = _________

So, 19 + 56 = _________
Fill in the blanks. Use number bonds to help you.

Example

27 + 49 = ?
27 + 50 = _____77_____  
_____77_____ – 1 = _____76_____  
So, 27 + 49 = _____76_____  

3. 15 + 48 = ?
15 + 50 = _________  
__________ – __________ = ___________  
So, 15 + 48 = ___________  

4. 26 + 47 = ?
26 + 50 = _________  
__________ – __________ = ___________  
So, 26 + 47 = ___________  

Add. Use mental math.

5. 28 + 56 = _________  

6. 34 + 49 = _________  

7. 17 + 67 = _________  

8. 58 + 47 = _________  

9. 55 + 59 = _________  

10. 67 + 36 = _________
Lesson 2.2  Mental Subtraction

Fill in the blanks. Use number bonds to help you.

Example

\[ 82 - 56 = ? \]

\[ 82 - 50 = \boxed{32} \]

\[ \boxed{32} - \boxed{6} = \boxed{26} \]

So, \( 82 - 56 = \boxed{26} \)

1. \( 73 - 58 = ? \)

\[ 73 - 50 = \boxed{} \]

\[ \boxed{} - \boxed{} = \boxed{} \]

So, \( 73 - 58 = \boxed{} \)

2. \( 84 - 37 = ? \)

\[ 84 - 30 = \boxed{} \]

\[ \boxed{} - \boxed{} = \boxed{} \]

So, \( 84 - 37 = \boxed{} \)

3. \( 94 - 55 = ? \)

\[ 94 - 50 = \boxed{} \]

\[ \boxed{} - \boxed{} = \boxed{} \]

So, \( 94 - 55 = \boxed{} \)
Fill in the blanks. Use number bonds to help you.

Example

\[
82 - 18 = \_
\]
\[
82 - 20 = \_
\]
\[
\_
\]
\[
20
\]
\[
2
\]
\[
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\]
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\_
\]
\[
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\]

So, \(82 - 18 = \_
\)

4. \(75 - 38 = \_
\)

\(75 - 40 = \_
\)

\(\_
\)
\(\_
\)
\(\_
\)

So, \(75 - 38 = \_
\)

5. \(83 - 45 = \_
\)

\(83 - 50 = \_
\)

\(\_
\)
\(\_
\)
\(\_
\)

So, \(83 - 45 = \_
\)

Subtract. Use mental math.

6. \(94 - 32 = \_
\)

7. \(78 - 53 = \_
\)

8. \(72 - 25 = \_
\)

9. \(65 - 38 = \_
\)

10. \(51 - 19 = \_
\)

11. \(84 - 37 = \_
\)
Lesson 2.3  More Mental Addition

Fill in the blanks. Use number bonds to help you.

Example

\[27 + 97 = ?\]

\[27 + 100 = \boxed{127}\]

\[\boxed{127} - \boxed{3} = \boxed{124}\]

So, \(27 + 97 = \boxed{124}\)

1. \(38 + 95 = ?\)

\[38 + 100 = \boxed{100}\]

\[\boxed{100} - \boxed{5} = \boxed{95}\]

So, \(38 + 95 = \boxed{143}\)

2. \(47 + 98 = ?\)

\[47 + 100 = \boxed{147}\]

\[\boxed{147} - \boxed{9} = \boxed{138}\]

So, \(47 + 98 = \boxed{138}\)

3. \(86 + 96 = ?\)

\[86 + 100 = \boxed{186}\]

\[\boxed{186} - \boxed{10} = \boxed{176}\]

So, \(86 + 96 = \boxed{182}\)
So, 78 + 99 = ________

5. 66 + 98 = ?

So, 66 + 98 = ________

Add. Use mental math.

6. 28 + 96 = ________ 7. 19 + 94 = ________

8. 47 + 98 = ________ 9. 69 + 99 = ________

10. 73 + 97 = ________ 11. 88 + 95 = ________

12. 55 + 96 = ________ 13. 32 + 99 = ________

14. 44 + 97 = ________ 15. 78 + 98 = ________
Lesson 2.4  Rounding Numbers to Estimate

Complete the table below.

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Rounded to the nearest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ten</td>
</tr>
<tr>
<td>1.</td>
<td>139</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>658</td>
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<tr>
<td>3.</td>
<td>1,099</td>
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<tr>
<td>4.</td>
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<tr>
<td>5.</td>
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</table>

Round each value to the nearest hundred.

6. A sofa costs $836.
$836 is $\underline{\hspace{2cm}}$ when rounded to the nearest $100.

7. Haven Road is 487 meters long.
487 meters is $\underline{\hspace{2cm}}$ meters when rounded to the nearest 100 meter.

8. The distance between two towns is 572 kilometers.
572 kilometers is $\underline{\hspace{2cm}}$ kilometers when rounded to the nearest 100 kilometer.

9. A factory can produce 7,970 toys each week.
7,970 is $\underline{\hspace{2cm}}$ when rounded to the nearest 100.
Find the greatest and least values for each when rounded to the nearest hundred.

10. A plane flew an estimated distance of 800 kilometers.
    The greatest distance the plane could have flown is __________ kilometers.
    The least distance the plane could have flown is __________ kilometers.

11. A small pool contains about 7,600 liters of water.
    The greatest amount of water the pool could have is __________ liters.
    The least amount of water the pool could have is __________ liters.

Solve. Show your work.

12. Mr. Thomas has $2,000.
    The computer costs about $__________.
    The printer costs about $__________.
    The camera costs about $__________.

Does Mr. Thomas have enough money to pay for all the items?
Find the sum. Use rounding to check that each answer is reasonable.

Example

\[ 225 + 472 = 697 \]

225 is about 200.

472 is about 500.

\[ 200 + 500 = 700 \]

So, 225 + 472 is about 700.

\[ 697 \] is close to \[ 700 \], so the answer is reasonable.

13. \[ 780 + 230 = \] 

780 is about \[ \] .

230 is about \[ \] .

\[ \] + \[ \] = \[ \]

So, 780 + 230 is about \[ \] .

\[ \] is close to \[ \] , so the answer is reasonable.
14. \(748 - 319 = \underline{\hspace{2cm}}\)

748 is about \underline{\hspace{2cm}}.

319 is about \underline{\hspace{2cm}}.

\underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}

So, \(748 + 319\) is about \underline{\hspace{2cm}}.

\underline{\hspace{2cm}} is close to \underline{\hspace{2cm}}, so the answer is reasonable.

15. \(527 - 288 = \underline{\hspace{2cm}}\)

527 is about \underline{\hspace{2cm}}.

288 is about \underline{\hspace{2cm}}.

\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}

So, \(527 - 288\) is about \underline{\hspace{2cm}}.

\underline{\hspace{2cm}} is close to \underline{\hspace{2cm}}, so the answer is reasonable.
Lesson 2.5  Using Front-End Estimation

Find the sum. Use front-end estimation to check that each answer is reasonable.

Example

\[219 + 567 = 786\]
\[200 + 500 = 700\]

The estimated sum is 700.
The answer 786 is reasonable.

1. \[268 + 323 = \boxed{591}\]
\[200 + 300 = \boxed{500}\]

The estimated sum is 500.
The answer 591 is reasonable.

2. \[479 + 624 = \boxed{1103}\]
\[400 + 600 = \boxed{1000}\]

The estimated sum is 1000.
The answer 1103 is reasonable.
Find the difference. Use front-end estimation to check that each answer is reasonable.

3. \[574 - 296 = \] 
   \[\quad - \quad = \quad\]
   The estimated difference is \[\quad\].
   Is the answer reasonable? \[\quad\].

4. \[916 - 378 = \] 
   \[\quad - \quad = \quad\]
   The estimated difference is \[\quad\].
   Is the answer reasonable? \[\quad\].

Find the sum or difference. Use front-end estimation to check that each answer is reasonable.

5. \[260 + 350 = \] 
   \[\quad + \quad = \quad\]
   The estimated sum is \[\quad\].
   Is the answer reasonable? \[\quad\].

6. \[425 + 272 = \] 
   \[\quad + \quad = \quad\]
   The estimated sum is \[\quad\].
   Is the answer reasonable? \[\quad\].
7. 590 – 466 = 

\[ \text{_______} - \text{_______} = \text{_______} \]

The estimated difference is ________.

Is the answer reasonable? ________.

8. 780 – 690 = 

\[ \text{_______} - \text{_______} = \text{_______} \]

The estimated difference is ________.

Is the answer reasonable? ________.

**Solve. Show your work.**

9. Beatrice has 136 books.
   Her brother has twice as many books as Beatrice.
   Estimate the number of books they have altogether.
10. A grocer sells 548 apples and 470 oranges. Estimate the number of fruits he sells altogether.

11. Kathy and Joe go for a jog. Kathy jogs 650 meters and Joe jogs 480 meters. Estimate the difference in the distances that they jog.
Put on Your Thinking Cap!

Add or subtract mentally.
Fill in the missing numbers in the puzzle.

1. 

<table>
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<th>53</th>
<th>=</th>
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<tbody>
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<tr>
<td>22</td>
<td>+</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Add or subtract mentally.

2. \(394 + 98 = \underline{\quad}\)  
3. \(206 + 103 = \underline{\quad}\)

4. \(445 - 99 = \underline{\quad}\)  
5. \(788 - 106 = \underline{\quad}\)

6. \(237 + 97 = \underline{\quad}\)  
7. \(313 - 109 = \underline{\quad}\)
Shade the given numbers. Then, fill in the next three numbers.

**Example**

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
```

1, 5, 9, 13, 17, 21

8.

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1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
```

1, 2, 4, 7, __________, __________, __________

Complete each number pattern.

9. 1, 2, 5, 10, 17, __________, __________, __________

10. 1, 2, 4, 8, 16, __________, __________, __________