

Important Concepts . . .

Preview Review



Mathematics

Grade 4

***W1 - Lesson 2: Addition and
Subtraction***

Important Concepts of Grade 4 Mathematics

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Materials Required

Mathematics Grade 4

Version 5

Preview/Review W1 - Lesson 2

Publisher: Alberta Distance Learning Centre

Author: Eric Boerger, Brian Key

Inhouse Teacher: Brian Key

Project Coordinator: Dennis McCarthy

Preview/Review Publishing Coordinating Team: Nina Johnson,

Laura Renkema, and Donna Silgard



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Preview/Review Concepts for Grade Four Mathematics



***W1 - Lesson 2:
Addition and
Subtraction***

OBJECTIVES

By the end of this lesson, you should

- identify the four basic number operations
- develop personal strategies for learning the basic addition/subtraction facts to 18
 - ▢ the addition chart
 - ▢ order property of addition
 - ▢ fact families
 - ▢ mental math
 - ▢
- add and subtract two-, three-, and four-digit numbers (with and without regrouping)
- solve story problems using addition and subtraction of whole numbers
- verify sums and differences by using the reverse operation
- choose the correct operation for addition and subtraction story problems

GLOSSARY

difference - the answer when one number is subtracted from another

number operations - adding, subtracting, multiplying, and dividing

HTO chart - a place value chart used to show hundreds, tens, and ones

sum - the answer when two or more numbers are

W1 - Lesson 2: Addition and Subtraction

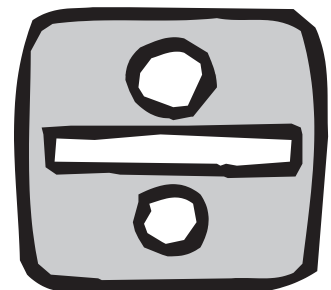
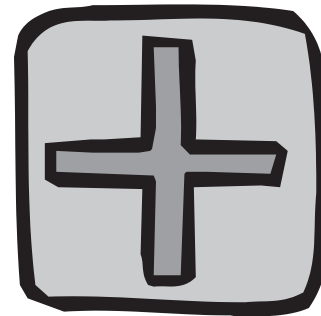
A. Introduction

In the first lesson, you learned about place value and how to show numbers in different ways. You learned how to compare numbers and how to round numbers. Numbers can also be used to solve problems. In this lesson you will learn more about how to use adding and subtracting to solve problems.

B. The Basic Number Operations

To solve most problems, you need to use one or more number operations. The four basic **number operations** are

- Adding
- Subtracting
- Multiplying
- Dividing



Read the following problem to see one example of how you can make use of the basic number operations.

You go to a store to buy Valentine cards for your classmates. There are 11 boys and 13 girls in your class. You want to buy some very special “Harry Potter” cards. The cards come in sets of 10 that cost \$2.98 per set. You also want to buy a small Lego set that costs \$5.95. You have saved \$12.00 from your allowance. Will you be able to buy the Valentine cards and the Lego set? If yes, how much money will you have left over? If not, how much money are you short?

To solve this problem, you must answer a lot of questions before you know which basic number operations to use.

1. Look at the chart below. In the first column are some of the questions that you will have to solve to find your answer. In the second column, write the operation that you would use to find the answer to each question.



Question	Operation
Example: How many students are there in your class?	Add
a. How many packages of cards will you need?	
b. How much will all the cards cost?	
c. Will you have enough money for the Lego set?	
d. How much money did you spend altogether?	
e. How much money will be left over (or are you short)?	

Were you surprised at how many questions and number operations you had to use to solve this problem? Adding, subtracting, multiplying, and dividing are operations we use all the time.

C. Adding Whole Numbers

Before you learn more about using adding and subtracting in this lesson, let's review the basic addition facts.

1. Complete the addition chart below. See if you notice any pattern occurring. The patterns can help you remember your basic addition facts.

Addition Chart

+	0	1	2	3	4	5	6	7	8	9
0	0	1	2	3						
1	1	2	3							
2	2	3								
3										
4										
5										
6										
7										
8										
9										

Order Property of Addition

The answer when two or more numbers are added together is called the **sum**. The numbers can be added in any order. The sum will be the same each time.

$$\begin{array}{rcl} 7 + 6 & = & 13 \\ 6 + 7 & = & 13 \end{array} \quad \begin{array}{c} \nearrow \\ \nwarrow \end{array} \text{same}$$

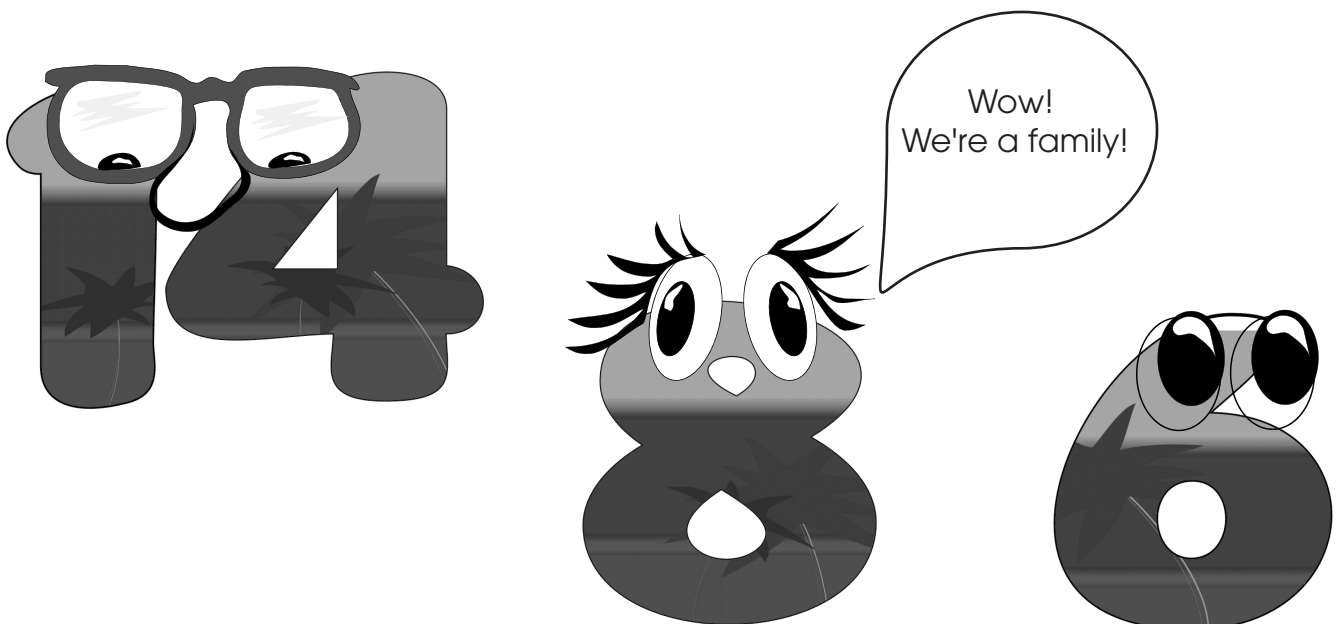
$$\begin{array}{rcl} 6 + 9 + 4 + 2 & = & 21 \\ 9 + 4 + 2 + 6 & = & 21 \end{array} \quad \begin{array}{c} \nearrow \\ \nwarrow \end{array} \text{same}$$

Fact Families

Addition and subtraction facts are related. The same numbers are used to write related addition or subtraction facts.

The numbers 6, 8, and 14 can be used to write $6 + 8 = 14$ or $8 + 6 = 14$. They can also be used to write $14 - 6 = 8$ or $14 - 8 = 6$.

The four different ways that the numbers 6, 8, and 14 can be written using adding or subtracting are all related. The four facts make up a **fact family**.



2. Look at each family of numbers below. Then, write the number facts for each family. The first one is done for you.

a. 6, 7, 13

$$\underline{6 + 7 = 13}$$

$$\underline{7 + 6 = 13}$$

$$\underline{13 - 6 = 7}$$

$$\underline{13 - 7 = 6}$$

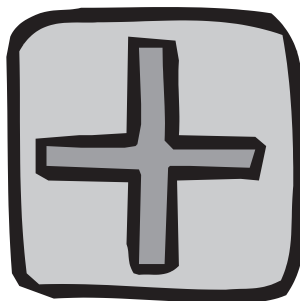
b. 3, 12, 15

c. 7, 8, 15

d. 2, 18, 20

e. 12, 13, 25

f. 9, 0, 9



Addition Strategies

The best way to solve addition questions is to know the basic addition facts that you wrote out in this lesson. **Spend time memorizing them. They are very important.** Here are three other strategies to help you when adding numbers.

Strategy 1: When one of the numbers is 1, 2, or 3, start with the greater number and count onward.

See: $7 + 3 = \underline{\quad}$
Think: 7 ... 8, 9, 10

See: $2 + 5 = \underline{\quad}$
Think: 5 ... 6, 7

3. a. $6 + 2 = \underline{\quad}$ b. $5 + 1 = \underline{\quad}$ c. $3 + 2 = \underline{\quad}$
d. $8 + 1 = \underline{\quad}$ e. $9 + 3 = \underline{\quad}$ f. $2 + 7 = \underline{\quad}$
g. $4 + 2 = \underline{\quad}$ h. $3 + 6 = \underline{\quad}$ i. $8 + 3 = \underline{\quad}$

Strategy 2: When one of the numbers is 1 more than the other number, think of doubles and then add 1.

See: $7 + 8 = \underline{\quad}$
Think: $7 + 7 = 14 \dots 15$

See: $6 + 5 = \underline{\quad}$
Think: $5 + 5 = 10 \dots 11$

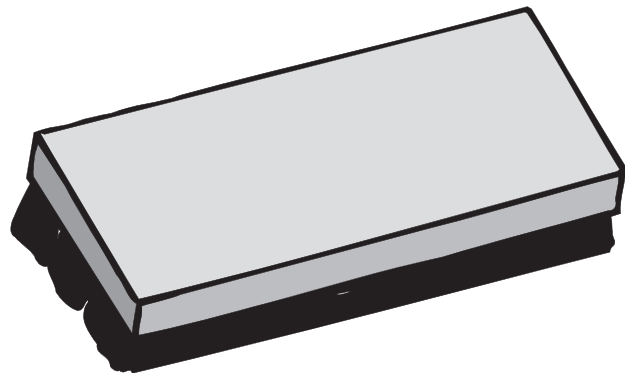
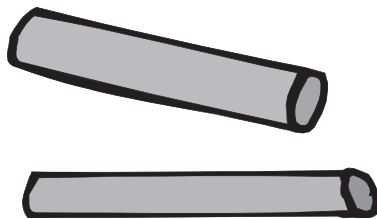
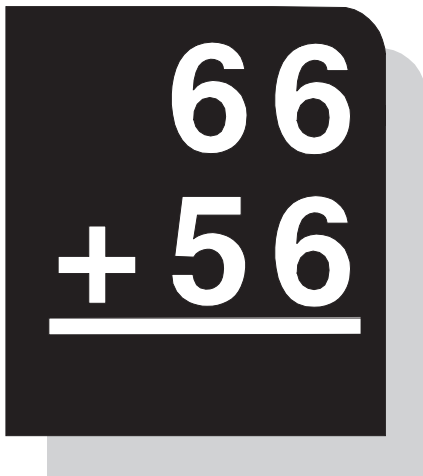
4. a. $5 + 6 = \underline{\quad}$ b. $4 + 5 = \underline{\quad}$ c. $6 + 7 = \underline{\quad}$
d. $8 + 9 = \underline{\quad}$ e. $3 + 4 = \underline{\quad}$ f. $8 + 7 = \underline{\quad}$

Strategy 3: When one of the numbers is 7, 8, or 9, make 10 and then add the extras.

See: $7 + 4 = \underline{\quad}$
Think: $7 + 3 = 10$,
then $10 + 1 = 11$

See: $3 + 9 = \underline{\quad}$
Think: $9 + 1 = 10$,
then $10 + 2 = 12$

5. a. $7 + 5 = \underline{\quad}$ b. $3 + 8 = \underline{\quad}$ c. $6 + 8 = \underline{\quad}$
d. $7 + 9 = \underline{\quad}$ e. $9 + 5 = \underline{\quad}$ f. $9 + 9 = \underline{\quad}$



Adding Two-Digit Numbers

When adding two-digit numbers, you may need to regroup during the addition operation. This is because only one digit can be written in each place value column. Look at the following question written on an **HTO chart**:

$$67 + 58 = ?$$

H	T	O
	¹ 6	7
+	5	8
		5

Add the ones:

$$7 + 8 = 15$$

Regroup 15 ones as 1 ten and 5 ones.

Write the 5 in the ones column.

Put the 1 ten at the top of the tens column.

H	T	O
	¹ 6	7
+	5	8
		5
	1	2
		5

Add the tens.

$$1 + 6 + 5 = 12$$

Regroup 12 tens as 1 hundred and 2 tens.

Write the 2 in the tens column.

Put the 1 hundred left of the 2 in the hundreds column.

$$67 + 58 = \underline{125}$$

6. Use the strategies from above and from the previous pages to add the numbers below.

a.
$$\begin{array}{r} 55 \\ + 37 \\ \hline \end{array}$$

b.
$$\begin{array}{r} 29 \\ + 46 \\ \hline \end{array}$$

c.
$$\begin{array}{r} 47 \\ + 18 \\ \hline \end{array}$$

d.
$$\begin{array}{r} 18 \\ + 15 \\ \hline \end{array}$$

e.
$$\begin{array}{r} 59 \\ + 17 \\ \hline \end{array}$$

f.
$$\begin{array}{r} 25 \\ + 18 \\ \hline \end{array}$$

g.
$$\begin{array}{r} 24 \\ + 67 \\ \hline \end{array}$$

h.
$$\begin{array}{r} 14 \\ + 19 \\ \hline \end{array}$$

i.
$$\begin{array}{r} 35 \\ + 16 \\ \hline \end{array}$$

j.
$$\begin{array}{r} 28 \\ + 68 \\ \hline \end{array}$$

You can check addition problems yourself to see if your answers are correct. To do this, use the opposite operation—subtracting. Subtract one of the two numbers that you were adding from the sum. If you get the other number, your answer (the sum) is correct.

Example:

To check, you subtract
either 23 or 56
from the sum

$$\begin{array}{r}
 56 \\
 + 23 \\
 \hline
 79
 \end{array}
 \quad \rightarrow \quad
 \begin{array}{r}
 79 \\
 - 23 \\
 \hline
 56
 \end{array}
 \quad \text{OR} \quad
 \begin{array}{r}
 56 \\
 + 23 \\
 \hline
 79
 \end{array}
 \quad \rightarrow \quad
 \begin{array}{r}
 79 \\
 - 56 \\
 \hline
 23
 \end{array}$$

7. Find the sums. Then check your answers.

a.
$$\begin{array}{r}
 24 \\
 + 39 \\
 \hline
 \end{array}$$

b.
$$\begin{array}{r}
 17 \\
 + 36 \\
 \hline
 \end{array}$$

c.
$$\begin{array}{r}
 28 \\
 + 46 \\
 \hline
 \end{array}$$

Check:

Check:

Check:

Regrouping to Add Larger Numbers

Larger numbers can be added in different ways. Here are three strategies that you can use. The first strategy is the easiest and the fastest.

If you wanted to add 276 and 495, you could use any of these strategies.

Strategy 1:

Add the ones.
Then regroup 11 ones
as 1 ten and 1 one.

$$\begin{array}{r} 1 \\ 276 \\ + 495 \\ \hline 1 \end{array}$$

Add the tens.
Regroup 17 tens as
1 hundred and 7 tens.

$$\begin{array}{r} 1 \ 1 \\ 276 \\ + 495 \\ \hline 71 \end{array}$$

Add the
hundreds.

$$\begin{array}{r} 1 \ 1 \\ 276 \\ + 495 \\ \hline 771 \end{array}$$

Strategy 2:

$$\begin{array}{r} 276 \\ + 495 \\ \hline 600 \\ 160 \\ 11 \\ \hline 771 \end{array}$$

← First add the hundreds.
← Then add the tens.
← Then add the ones.
← Then add them all together.

Strategy 3:

495 is 5 less than 500.

$276 + 500 = 776$ ← Therefore, add 500 to 276

$776 - 5 = 771$ ← Because you added 5 to 495 to get 500, you must subtract 5 from the sum: $776 - 5 = ?$

$$276 + 495 = 771$$

Adding Larger Numbers

When adding 3- and 4-digit numbers, regrouping may also be necessary. Look at the following example.

$ \begin{array}{r} 1 \\ 346 \\ + 286 \\ \hline 2 \end{array} $ <p>① Add the ones. $6 + 6 + 12$ 12 is 1 ten and 2 ones. Put the 1 in the tens column.</p>	$ \begin{array}{r} 11 \\ 346 \\ + 286 \\ \hline 32 \end{array} $ <p>② Add the tens. Don't forget the 1 ten $1 + 4 + 8 = 13$ 13 tens is 1 hundred and 3 tens. Put the 1 hundred in the hundreds column.</p>
$ \begin{array}{r} 11 \\ 346 \\ + 286 \\ \hline 632 \end{array} $ <p>③ Add the hundreds. Don't forget the 1 hundred. $1 + 3 + 2 = 6$</p>	

8. Find the sum for each question.

a. $\begin{array}{r} 22 \\ + 579 \\ \hline \end{array}$	b. $\begin{array}{r} 398 \\ + 352 \\ \hline \end{array}$	c. $\begin{array}{r} 375 \\ + 246 \\ \hline \end{array}$	d. $\begin{array}{r} 519 \\ + 399 \\ \hline \end{array}$	e. $\begin{array}{r} 634 \\ + 689 \\ \hline \end{array}$
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9. Add these numbers. Be careful when you are regrouping the numbers.

a. $\begin{array}{r} 4\ 840 \\ + 1\ 023 \\ \hline \end{array}$	b. $\begin{array}{r} 5\ 462 \\ + 923 \\ \hline \end{array}$	c. $\begin{array}{r} 2\ 640 \\ + 3\ 173 \\ \hline \end{array}$	d. $\begin{array}{r} 7\ 731 \\ + 1\ 273 \\ \hline \end{array}$
--	---	--	--

10. Add these sets of 3 numbers. Be sure to watch the place value of all the digits very carefully.

a. $\begin{array}{r} 18 \\ 11 \\ + 27 \\ \hline \end{array}$	b. $\begin{array}{r} 21 \\ 3 \\ + 84 \\ \hline \end{array}$	c. $\begin{array}{r} 76 \\ 27 \\ + 8 \\ \hline \end{array}$	d. $\begin{array}{r} 2 \\ 56 \\ + 31 \\ \hline \end{array}$	e. $\begin{array}{r} 51 \\ 23 \\ + 5 \\ \hline \end{array}$
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D. Subtracting Whole Numbers

As you have already learned, subtracting numbers is the reverse or opposite of adding numbers. When one number is subtracted from another, the answer is called the **difference**.

Knowing your addition facts helps you solve subtraction questions. For example, if you know that $7 + 8 = 15$, then you know that $15 - 8 = 7$ or that $15 - 7 = 8$.

Beware of the Subtraction Trap!

Don't get caught!

You cannot subtract a larger number from a smaller number.



Example:

In $40 - 26 = ?$ some students try to take 6 ones away from 0 ones, like this:

Wrong

$$\begin{array}{r} 40 \\ - 26 \\ \hline 26 \end{array} \quad \times$$

If the top digit is too small, then you must regroup. Change 1 ten into 10 ones, add them to the ones already there, and then subtract the bottom number.

Right

$$\begin{array}{r} 10 \\ \cancel{40} \\ - 26 \\ \hline 14 \end{array} \quad \checkmark$$

1. Subtract these numbers. Write the difference. Regroup and borrow if necessary.

a.
$$\begin{array}{r} 65 \\ - 22 \\ \hline \end{array}$$

b.
$$\begin{array}{r} 28 \\ - 13 \\ \hline \end{array}$$

c.
$$\begin{array}{r} 63 \\ - 24 \\ \hline \end{array}$$

d.
$$\begin{array}{r} 96 \\ - 35 \\ \hline \end{array}$$

e.
$$\begin{array}{r} 86 \\ - 85 \\ \hline \end{array}$$

f.
$$\begin{array}{r} 78 \\ - 33 \\ \hline \end{array}$$

g.
$$\begin{array}{r} 36 \\ - 28 \\ \hline \end{array}$$

h.
$$\begin{array}{r} 77 \\ - 35 \\ \hline \end{array}$$

i.
$$\begin{array}{r} 80 \\ - 31 \\ \hline \end{array}$$

j.
$$\begin{array}{r} 92 \\ - 54 \\ \hline \end{array}$$

2. Solve each of the following story problems. Show your calculation, and write a word answer for each problem (e.g., 27 people).

- a. Jonathan and his family drove to Victoria, a distance of 986 km from Grande Prairie. They were able to drive 521 km the first day. How many kilometres did they still have left to drive to Victoria?



- b. There are 211 students in an elementary school. If 53 students are sick with the flu and cannot come to school one day, how many students will be at the school that day?



- c. During the month of February, a Grade Four class raised \$356 for their field trip to Drumheller. In March, they raised \$481 for the field trip. How much more did the class raise in March than in February?

3. Find the differences for these questions. Use the reverse operation (addition) to check your answer. Watch out! Don't get caught in the Subtraction Trap!

a.
$$\begin{array}{r} 4\ 345 \\ - 3\ 261 \\ \hline \end{array}$$

Check

b.
$$\begin{array}{r} 3\ 920 \\ - 2\ 842 \\ \hline \end{array}$$

Check

c.
$$\begin{array}{r} 1\ 135 \\ - 841 \\ \hline \end{array}$$

Check

d.
$$\begin{array}{r} 9\ 004 \\ - 7\ 539 \\ \hline \end{array}$$

Check

E. Problem Solving

In W1 - Lesson 1, you were introduced to the 4-step process for problem solving.

1. List the four steps in the Problem Solving Process.

a. _____ b. _____

c. _____ d. _____

Step 2 of the Problem-Solving Process asks you to make a plan. Some plans are very easy to make. All you have to do is choose what operation to use.

Example: The school library had 879 books. The librarian took 186 books off the shelves because they were old or worn. How many books were left in the library?

Step 1: Read and understand what the problem is asking.

Step 2: In this problem, your plan for Step 2 is simply to choose the correct operation that will give you the answer. Do you need to add, subtract, multiply, or divide?

The answer is **subtract**. To find how many books were left on the shelf, you must subtract.

Step 3: Try the plan.

$$\begin{aligned}879 - 186 &= ? \\879 - 186 &= \mathbf{693}\end{aligned}$$

Step 4: Look back. Write the answer in a sentence.

“There were 693 books left in the library.”

Ask: Does the answer make sense? Yes, the answer shows there were about 200 fewer books left.

Choosing the Correct Operation

Read each problem carefully. Solve each one by choosing the correct operation. Show all your work.

2. Bob spent \$3.87 on a toy. He paid with a \$10.00 bill. How much change should he get back?



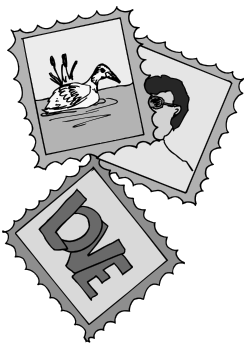
3. Jennifer spent \$28.50 on a pair of jeans, \$8.99 on a blouse, and \$0.75 on a can of pop. How much did she spend?



4. The Grade Four class was collecting pop cans to recycle for their Science unit. On Monday, they collected 18 cans. On Tuesday, they collected 34 cans. On Wednesday, they collected only 9 cans. What is the total number of cans that they collected during the 3 days?



5. Sally and Henry both had stamp collections. Sally had 3 678 stamps in her collection. Henry had only 2 049 stamps in his collection. How many more stamps did Sally have in her collection?



6. Steve weighed 56 kilograms and Jared weighed 38 kilograms. How much more did Steve weigh than Jared?



Homework

1. Add.

a.
$$\begin{array}{r} 721 \\ + 189 \\ \hline \end{array}$$

b.
$$\begin{array}{r} 496 \\ + 366 \\ \hline \end{array}$$

c.
$$\begin{array}{r} 519 \\ + 181 \\ \hline \end{array}$$

d.
$$\begin{array}{r} 131 \\ + 689 \\ \hline \end{array}$$

e.
$$\begin{array}{r} 700 \\ + 197 \\ \hline \end{array}$$

2. Subtract. Don't get caught in the Subtraction Trap!

a.
$$\begin{array}{r} 60 \\ - 18 \\ \hline \end{array}$$

b.
$$\begin{array}{r} 36 \\ - 27 \\ \hline \end{array}$$

c.
$$\begin{array}{r} 837 \\ - 548 \\ \hline \end{array}$$

d.
$$\begin{array}{r} 335 \\ - 26 \\ \hline \end{array}$$

e.
$$\begin{array}{r} 6\,750 \\ - 4\,902 \\ \hline \end{array}$$

3. You decide to have a party. You plan to invite 11 guests, so there will be 12 people including yourself. Invitations come in packages of 8 that cost \$2.00. You buy two packages. You also decide to buy some pop and snacks for the party. Pop is on sale at \$3.00 for a case of 12. You buy 3 cases. Potato chips are also on sale at 3 bags for \$4.00. You buy 6 bags. You give the clerk \$25.00. How much change will you get back?

Draw the change you will get back.

