

Name _____

Lesson 2-1 Mental Math

Solve & Share
Three pieces of software cost \$20.75, \$10.59, and \$18.25. What is the total cost of the software?
Use mental math to solve.

You should show your work.

You can use **reasoning** to help you. What do you know about adding three numbers that will make it easier to solve this problem?

I can ...
Use mental math to solve addition and subtraction problems.

I can also reason about math.

C - cost of the software

\$20.75	\$10.59	\$18.25
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$\$20.75 + \$10.59 + \$18.25 = C$

$20.75 + 10.59 + 18.25 = 20.75 + 18.25 + 10.59$

$39.00 + 10.59$
 $\$49.59$

The total cost is \$49.59

Look Back! Construct Arguments Which two numbers above were easy to add in your head? Why?
\$20.75 and \$18.25 because the cents equals a whole dollar. These are called **Compatible Numbers**.

Assess the Situation How Can You Use Mental Math to Add?

Properties of addition can help you find the total cost of these three items.

The Commutative Property and Associative Property make it easy to add $\$11.45 + \$3.39 + \$9.55$.

Associative Property lets you change the grouping of addends.
 $(\$11.45 + \$3.39) + \$9.55 = \$11.45 + (\$3.39 + \$9.55)$

Commutative Property lets you add two decimals in any order.
 $\$11.45 + \$3.39 = \$3.39 + \11.45

Use the Commutative Property to change the order.
 $\$11.45 + (\$3.39 + \$9.55) =$
 $\$11.45 + (\$9.55 + \$3.39)$

Use the Associative Property to change the grouping.
 $(\$11.45 + \$9.55) + \$3.39 =$
 $(\$11.45 + \$9.55) + \$3.39$

Add \$11.45 and \$9.55 first because they are easy to compute mentally.
 $\$11.45 + \$9.55 = \$21$
 $\$21 + \$3.39 = \$24.39$

The three items cost a total of \$24.39.

Compatible numbers are numbers that are easy to compute mentally.

Convince Me! Reasoning Use mental math to find the sum. Explain your thinking.

Jim earns \$22.50, \$14.75, and \$8.50 on three different days. How much did he earn in all?

$22.50 + 14.75 + 8.50 = 22.50 + 8.50 + 14.75$
 $31.00 + 14.75$
 $\$45.75$



Another Example

With **compensation**, adjust one or both numbers to make the calculation easier. Then adjust the difference or sum to get the final answer.

Use compensation to subtract.

Find $4.25 - 0.08$ mentally.

$$4.25 - 0.10 = 4.15$$

0.02 too much was subtracted

Compensate, add back 0.02

$$4.25 - 0.08 = 4.17$$

Use compensation to add.

Find $\$3.47 + \4.35 mentally.

$$\$3.50 + \$4.35 = \$7.85$$

Add 0.03

Compensate, take away 0.03

$$\$3.47 + \$4.35 = \$7.82$$

Guided Practice

Do You Understand?

- Be Precise** In the addition example above, why is the answer \$0.03 less than \$7.85?

Compensation changed the addend \$3.47 to \$3.50

Do You Know How?

In 3-6, use mental math to add or subtract.

$$3. 12 + 3.04 + 8.28 = 15.04 + 8.28 = 23.32$$

$$4. 6.97 + 4.15 = 7.00 + 4.12 = 11.12$$

$$5. 9.04 - 6.98 = 9.06 - 7.00 = 2.06$$

$$6. 4.02 + 0.19 + 16.48 = 4.62 + 16.48 + 0.19 = 20.50 + 0.19 = 20.69$$

$$\begin{array}{r} 12.00 \\ + 3.04 \\ + 8.28 \\ \hline 23.32 \end{array}$$

Complete 9, 12, 13, + 20

9. $\$18.25 + \$7.99 + \$4.75$

$$18.25 + 4.75 + 7.99 = 23.00 + 7.99 = \$30.99$$

$$\begin{array}{r} 18.25 \\ + 4.75 \\ + 7.99 \\ \hline \$30.99 \end{array}$$

12. $35.9 - 14.8$

$$35.9 - 15.0 = 20.9$$

$$\begin{array}{r} 35.9 \\ - 14.8 \\ \hline 20.9 \end{array}$$

13. **Model with Math** Joanne bought three books that cost \$3.95, \$4.99, and \$6.05. How much did she spend in all? Use compensation and mental math to find the sum.

? spent →

	?	
\$3.95	\$4.99	\$6.05

$$\$3.95 + \$4.99 + \$6.05 = \$3.95 + \$6.05 + \$4.99 = \$10.00 + \$4.99 = \$14.99$$

$$\begin{array}{r} 3.95 \\ + 4.99 \\ + 6.05 \\ \hline \$14.99 \end{array}$$

20. Mrs. Healer's class took a field trip to a park 12.3 miles away. Mr. Dean's class drove 4.9 miles to the public library. How much farther did Mrs. Healer's class travel than Mr. Dean's class? Explain how you used mental math to determine the difference.

12.3 - 4.9, Add 0.1 to each number and then subtract 12.4 - 5.0 to get 7.4.