



# Examples of Strategies



# Mental Math

## Grade 9 Mathematics (10F)

S-1

### Sample Strategies

#### Begin adding from the left

When you do addition questions using paper and pencil, you usually start from the right and work toward the left.



To do addition in your head, start from the left.

**EXAMPLE 1**

$$\begin{array}{r} 46 \\ + 38 \\ \hline \end{array}$$

$$40 + 30 = 70$$

$$6 + 8 = 14$$

$$70 + 14 = 84$$

**EXAMPLE 2**

$$\begin{array}{r} 25.6 \\ + 13.7 \\ \hline \end{array}$$

$$20 + 10 = 30$$

$$5 + 3 = 8$$

$$\frac{6}{10} + \frac{7}{10} = 1 \text{ and } \frac{3}{10}$$

$$30 + 8 + 1\frac{3}{10} = 39.3$$

# Mental Math

## Grade 9 Mathematics (10F)

S-2

### Sample Strategies

#### Break down numbers and add their parts

Here's another way of doing addition in your head.

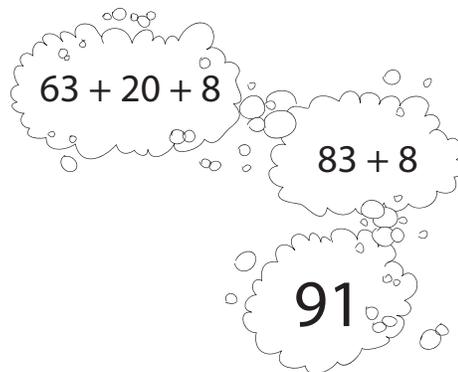
$$\begin{array}{r} 63 \\ + 28 \\ \hline \end{array}$$



Break down the numbers, then add their parts.

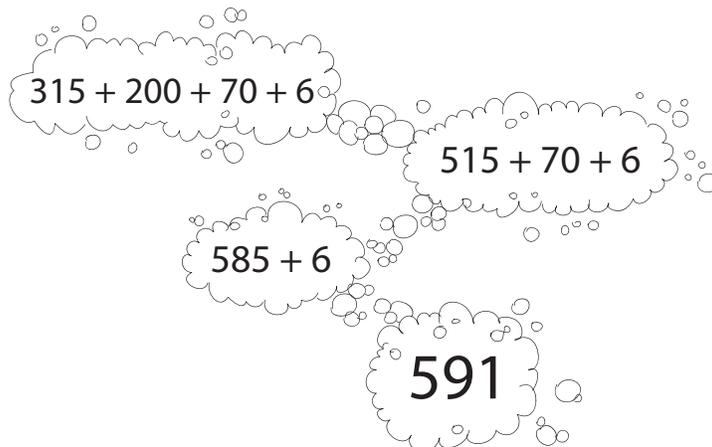
EXAMPLE  
1

$$\begin{array}{r} 63 \\ + 28 \\ \hline \end{array}$$



EXAMPLE  
2

$$\begin{array}{r} 315 \\ + 276 \\ \hline \end{array}$$



# Mental Math

## Grade 9 Mathematics (10F)

S-3

### Sample Strategies

#### Finding compatible numbers

Compatible numbers are pairs of numbers that are easy to add in your head.

The following are examples of compatible numbers:



The sum equals 100



The sum equals 600



Find the pairs of compatible numbers that add up to 300.

140

85

160

118

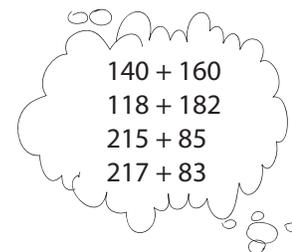
217

73

215

182

83



Find the pairs of compatible numbers that add up to 800.

250

175

567

333

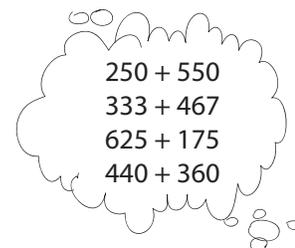
440

467

625

550

360



# Mental Math

## Grade 9 Mathematics (10F)

S-4

### Sample Strategies

#### Create your own compatible numbers



Sometimes it is easier to do addition in your head by creating your own compatible numbers and adjusting the total.

EXAMPLE  
1

$$\begin{array}{r} 650 \\ + 375 \\ \hline \end{array}$$

$$650 + 350 + 25$$

$$1000 + 25$$

1025

EXAMPLE  
2

$$\begin{array}{r} 1250 \\ + 753 \\ \hline \end{array}$$

$$1250 + 750 + 3$$

$$2000 + 3$$

2003

# Mental Math

## Grade 9 Mathematics (10F)

S-5

### Sample Strategies

#### Subtract starting from the left

Here's a technique that works well when doing subtraction questions that do not require grouping.



To do subtraction in your head, start from the left and think of your answer one part at a time.

**EXAMPLE 1**

$$\begin{array}{r} 468 \\ - 323 \\ \hline \end{array}$$

$$400 - 300 = 100$$

$$60 - 20 = 40$$

$$8 - 3 = 5$$

$$100 + 40 + 5 = 145$$

**EXAMPLE 2**

$$\begin{array}{r} 9514 \\ - 6203 \\ \hline \end{array}$$

$$9000 - 6000 = 3000$$

$$500 - 200 = 300$$

$$14 - 3 = 11$$

$$3000 + 300 + 11 = 3311$$

# Mental Math

## Grade 9 Mathematics (10F)

S-6

### Sample Strategies

#### Subtract one part at a time



When you do a subtraction question that requires a grouping, subtract one part at a time.

EXAMPLE  
1

$$\begin{array}{r} 132 \\ - 59 \\ \hline \end{array}$$

$$132 - 50 = 82$$

$$82 - 9 = 73$$

Check your answer by adding the following in your head:

$$73 + 59 = 120 + 12 = 132$$

EXAMPLE  
2

$$\begin{array}{r} 6.25 \\ - 3.15 \\ \hline \end{array}$$

$$6.25 - 3 = 3.25$$

$$3.25 - 0.15 = 3.10$$



Don't forget to check your answer doing a mental addition.

# Mental Math

## Grade 9 Mathematics (10F)

S-7

### Sample Strategies

#### Balance subtraction with whole numbers

When you add the same number to the two elements of a subtraction question, the difference between the two does not change.



By adding to both elements, you balance the subtraction.

That makes it easier to find the answer in your head.

**EXAMPLE  
1**

$$\begin{array}{r} 76 \\ - 28 \\ \hline \end{array}$$

$$76 + 2 = 78$$

$$28 + 2 = 30$$

$$78 - 30 = 48$$

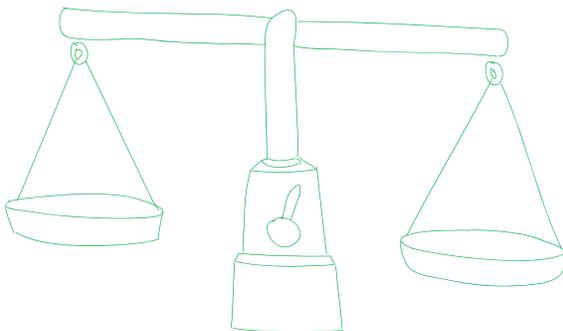
**EXAMPLE  
2**

$$\begin{array}{r} 660 \\ - 185 \\ \hline \end{array}$$

$$660 + 15 = 675$$

$$185 + 15 = 200$$

$$675 - 200 = 475$$



# Mental Math

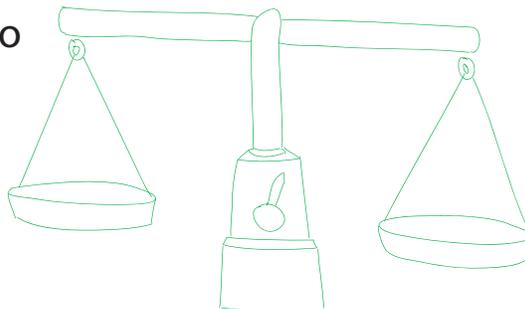
## Grade 9 Mathematics (10F)

S-8

### Sample Strategies

#### Balance subtraction with decimal numbers

When you add the same number to the two elements of a subtraction question, the difference between the two does not change.



Adding to both elements balances the subtraction.

That makes it easier to find the answer in your head.

**EXAMPLE 1**

$$\begin{array}{r} 4.32 \\ - 1.95 \\ \hline \end{array}$$

$$4.32 + 0.05 = 4.37$$

$$1.95 + 0.05 = 2$$

$$4.37 - 2 = 2.37$$

**EXAMPLE 2**

$$\begin{array}{r} 23.62 \\ - 15.89 \\ \hline \end{array}$$

$$23.62 + 0.11 = 23.73$$

$$15.89 + 0.11 = 16$$

$$23.73 - 16 = 7.73$$



Remember that you have to make sure the second element (not the first) becomes a number that is easy to subtract.

# Mental Math

## Grade 9 Mathematics (10F)

S-9

### Sample Strategies

#### Multiply starting from the left



It is easier to multiply in your head when you break down a number and multiply starting from the left.

Add in your head as you multiply each part.

EXAMPLE  
1

$$\begin{array}{r} 635 \\ \times 4 \\ \hline \end{array}$$

$$600 \times 4 = 2400$$

$$30 \times 4 = 120$$

$$5 \times 4 = 20$$

$$2400 + 120 + 20 =$$

$$2540$$

EXAMPLE  
2

$$\begin{array}{r} 528 \\ \times 3 \\ \hline \end{array}$$

$$500 \times 3 = 1500$$

$$20 \times 3 = 60$$

$$8 \times 3 = 24$$

$$1500 + 60 + 24 = 1584$$

# Mental Math

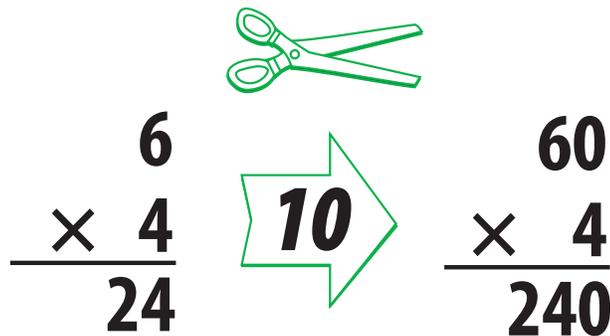
## Grade 9 Mathematics (10F)

S-10

### Sample Strategies

#### Cut and paste the zeros

In multiplication, when one factor is multiplied by 10, the result is also multiplied by 10.


$$\begin{array}{r} 6 \\ \times 4 \\ \hline 24 \end{array} \xrightarrow{10} \begin{array}{r} 60 \\ \times 4 \\ \hline 240 \end{array}$$

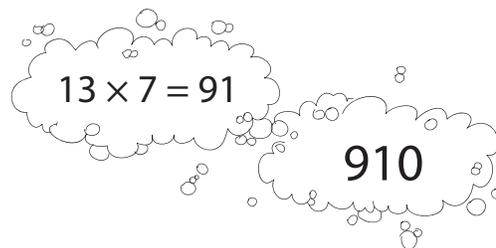
Knowing this concept, you can easily multiply by 10 in your head by following these steps:



1. Cut all the zeros at the end.
2. Multiply the remaining numbers.
3. Paste all the zeros back.

EXAMPLE  
1

$$\begin{array}{r} 13 \\ \times 70 \\ \hline \end{array}$$

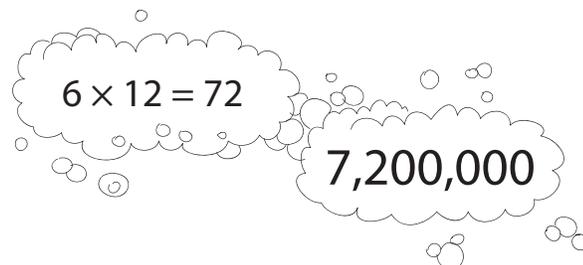


$13 \times 7 = 91$

910

EXAMPLE  
2

$$\begin{array}{r} 6000 \\ \times 1200 \\ \hline \end{array}$$



$6 \times 12 = 72$

7,200,000

# Mental Math

## Grade 9 Mathematics (10F)

S-11

### Sample Strategies

#### Cut and paste the zeros

To mentally divide numbers that end in zero, follow these steps:



1. Cut all the zeros at the end.
2. Do the division.
3. Paste the zeros back.



**EXAMPLE**  
1

$$\begin{array}{r} 2400 \\ \div 6 \\ \hline \end{array}$$

$24 \div 6 = 4$

400

Check the answer by multiplying:  $6 \times 400 = 2400$

**EXAMPLE**  
2

$$\begin{array}{r} 45,000 \\ \div 15 \\ \hline \end{array}$$

$45 \div 15 = 3$

3000

Check:  $15 \times 3000 = 45,000$

# Mental Math

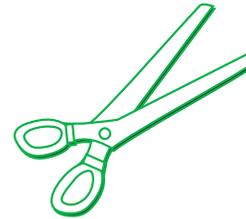
## Grade 9 Mathematics (10F)

S-12

### Sample Strategies

#### Cut the zeros in dividend and divisor

When dividing the dividend and divisor by the same amount, the quotient does not change.



$$\begin{array}{r} 800 \\ \div 20 \\ \hline \end{array} \quad \rightarrow \quad \begin{array}{r} 80 \\ \div 2 \\ \hline \end{array} \quad \rightarrow \quad 40$$

Knowing this concept will help you do division in your head more easily when the dividend and the divisor both end in zero.



All you have to do is divide both the dividend and divisor by the same value, 10.

EXAMPLE  
1

$$\begin{array}{r} 6300 \\ \div 90 \\ \hline \end{array}$$

630 ÷ 9

70

EXAMPLE  
2

$$\begin{array}{r} 4,500,000 \\ \div 500 \\ \hline \end{array}$$

45,000 ÷ 5

9000

# Mental Math

## Grade 9 Mathematics (10F)

S-13

### Sample Strategies

#### Work with prices

The sale price of items is often a little less than an even number of dollars.



To work with prices in your head, round off to the nearest dollar. Then, do the calculation required by the problem and adjust your answer.

EXAMPLE  
1

$$\begin{array}{r} \$16.65 \\ + \$2.99 \\ \hline \end{array}$$

$$\begin{array}{l} \$16.65 + \$3 \\ = \$19.65 \end{array}$$

$$\$19.65 - 1\text{¢} =$$

$$\$19.64$$

EXAMPLE  
2

$$\begin{array}{r} \$19.98 \\ \times \quad 6 \\ \hline \end{array}$$

$$6 \times \$20 = \$120$$

$$6 \times 2\text{¢} = 12\text{¢}$$

$$\$120 - 12\text{¢} =$$

$$\$119.88$$

# Mental Math

## Grade 9 Mathematics (10F)

S-14

### Sample Strategies

#### Check your change

When you buy something, it is important to check that the amount of change returned to you is correct.

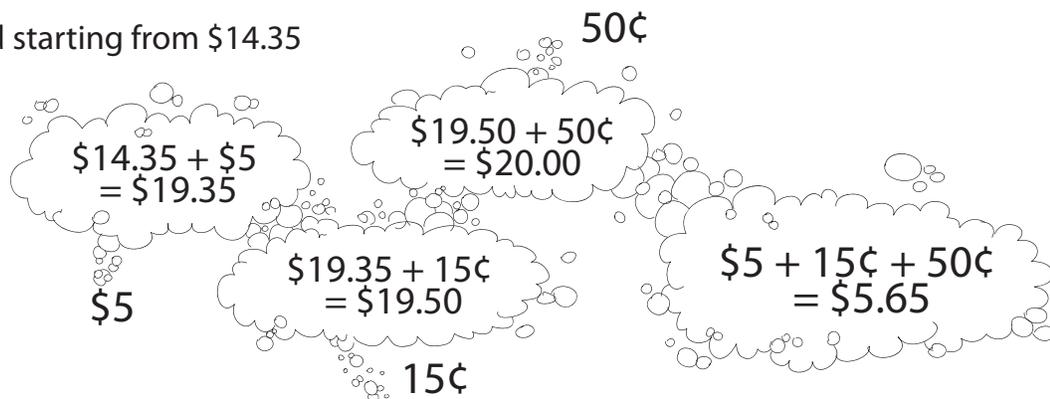


There is an easier way than subtracting in your head:  
**add to the purchase price.**

**EXAMPLE 1**

You buy a CD for \$14.35 with a \$20 bill. How much change should you get back?

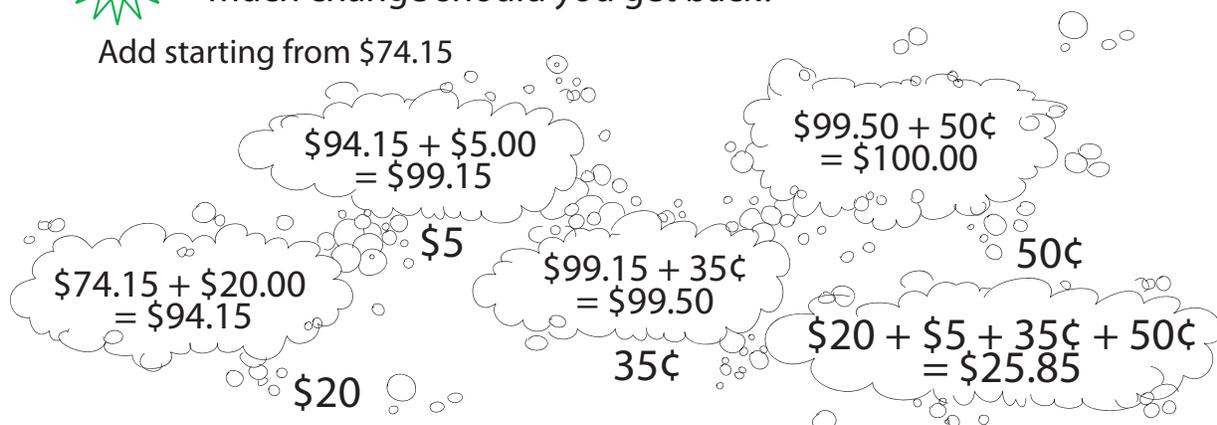
Add starting from \$14.35



**EXAMPLE 2**

You buy a watch for \$74.15 with a \$100 bill. How much change should you get back?

Add starting from \$74.15



# Mental Math

## Grade 9 Mathematics (10F)

S-15

### Sample Strategies

#### Find the time difference

Mental math calculation is useful to find how much time is left before an event.



To find the difference between two given times, add by steps.

**EXAMPLE 1**

If it is 8:27 a.m., how long do you have to wait before lunch at noon?

8:27 a.m. to 8:30 a.m.  
3 MINUTES

TO 9:00 a.m.  
30 MINUTES

TO 12:00 noon  
3 HOURS

3 HOURS  
33 MINUTES

**EXAMPLE 2**

If it is 9:50 a.m., how much time is there before 8:15 p.m.?

9:50 a.m. to 10:00 a.m.  
10 MINUTES

TO 8:15 p.m.  
15 MINUTES

TO 8:00 p.m.  
10 HOURS

10 HOURS  
25 MINUTES

