Multiplication Algorithms

You have probably used both of these methods.
In grade 6, we tend to use the "short algorithm."

* A Short Algorithm *(used in grade 6

Multiply each part of the second factor by the first factor.

```
               73   ← Factors
            *  46   ←
6 * 73 =      438
40 * 73 =  + 2920
             3358
              ↑
           Product
```

Example: 73 * 46 = ?

The Partial-Products Method

Multiply each part of one factor by each part of the other factor.
Then add the partial products.

```
               73
            *  46
40 * 70 =    2800
40 * 3 =      120
6 * 70 =      420
6 * 3 =     +  18
             3358
```

1. 14 × 5	**2.** 32 × 87 =	**3.** 625 × 40
4. 32 × 91	**5.** 873 × 25	**6.** 6 × 1,280 =

Refresher Worksheet 2
Division of Whole Numbers

Long division lets you divide large numbers. The *dividend* is the number to be divided into; the *divisor* is the number you divide by. The *quotient* is the result of the division.

Example:

$$15\overline{)930}\quad 62$$
$$-90$$
$$30$$
$$-30$$
$$0$$

1) How many 15's are in 93? 6
2) multiply: $6 \times 15 = 90$
3) subtract: $93 - 90 = 3$
4) Compare → is 3 smaller than 15 (divisor)? yes
5) Bring down 0...
6) Repeat...
1) How many 15's are in 30? 2... and so on...

Reminders:

- Divide.
- Multiply
- Subtract
- Compare
- Bring Down.
- Repeat / Remainder.

Practice: Find each quotient.

(1) $6\overline{)82}$

(2) $3\overline{)784}$

(3) $8\overline{)792}$

30)900

50)370

6) 42)210

7) 12)198

8) 39)1,530

9) 22)1,980

Refresher Worksheet 3 / page 4

Adding and Subtracting Decimals

Adding and subtracting decimal numbers is the same as for whole numbers, but you have to be sure the place values are lined up.

Example

Find 83.6 + 20.7.

- Set up the problem by lining the decimal points up. This puts the place values in the proper places.

```
 83.6
+20.7
```

- Put a decimal under the decimals of the addends, then add as you would for whole numbers.

```
 83.6
+20.7
104.3
```

Find 973.22 − 80.05.

- Set up the problem by lining the decimal points up. This puts the place values in the proper places.

```
973.22
−80.05
```

- Put a decimal under the other decimals, then subtract as you would for whole numbers.

```
973.22
−80.05
893.17
```

Find 53.2 − 14.88.

- Set up the problem by lining the decimal points up.

```
 53.2
−14.88
```

- Notice that 53.2 has no number in the hundredths place, but 14.88 has an 8 in the hundredths place. You can write 0 in the hundredths place for 53.2. Then subtract as you would for whole numbers.

```
53.20
−14.88
 38.32
```

Practice

Find each sum or difference.

1. 32.5 + 82.4	**2.** 144.97 + 837.66	**3.** 206.619 + 93.11
4. 71.8 − 20.2	**5.** 248.23 − 80.89	**6.** 419.6 − 146.48

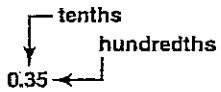
Refresher Worksheet 4 / page 5

Writing Decimals as Fractions

The key to writing decimals as fractions is to understand *place value.* Each digit in a number tells how many groups are in the number. The first digit to the left of the decimal point tells how many *ones* are in the number. The next digit tells how many *tens,* and the next digit tells how many *hundreds.* The digits to the right of the decimal point tell what part of a whole is in the number. The first digit to the right tells how many *tenths* are in the number. The next digit tells how many *hundredths.*

Example

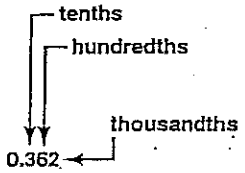
Write 0.35 as a fraction.



- Identify the place value of the last digit.
- Since the 5 is in the hundredths place, the denominator is 100. Write the digits in the numerator, without the decimal point.

$$\frac{35}{100}$$

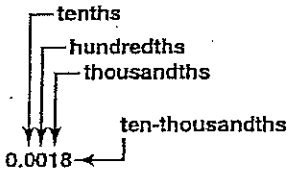
Write 0.362 as a fraction.



- Identify the place value of the last digit.
- Since the 2 is in the thousandths place, the denominator is 1,000. Write the digits in the numerator, without the decimal point.

$$\frac{362}{1{,}000}$$

Write 0.0018 as a fraction.



- Identify the place value of the last digit.
- Since the 8 is in the ten-thousandths place, the denominator is 10,000. Write the digits in the numerator, without the decimal point. Since 0018 is the same as 18, drop the leading zeroes.

$$\frac{18}{10{,}000}$$

Practice

Write each decimal as a fraction.

1. 0.21 **2.** 0.08 **3.** 0.882

4. 0.092 **5.** 0.5629 **6.** 0.0025

Name _____ Date _____

Refresher Worksheet 5 /page 6

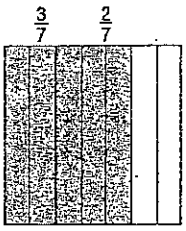
Adding and Subtracting Fractions with the Same Denominator

In a fraction, the denominator tells how many equal-sized pieces make up a whole. The numerator tells how many of those pieces you have.

When two fractions have the same denominator, both fractions involve pieces that are the same size. That means you can add them by thinking about the total number of pieces. You can subtract by thinking about how many pieces would be left over if you take some away.

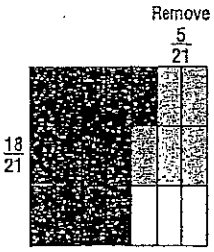
Example

Add $\frac{2}{7} + \frac{3}{7}$.



- One fraction involves 2 pieces, each a seventh of a whole. The other fraction is 3 pieces, each a seventh of a whole.
- Together, there are 5 pieces, each a seventh of a whole, so the sum is $\frac{5}{7}$.

Subtract $\frac{18}{21} - \frac{5}{21}$.



- The first fraction involves 18 pieces, all the same size (all the shaded rectangles on the right).
- If you take away 5 of the pieces (the lightly-shaded rectangles), you have 13 left (the dark rectangles). The difference is $\frac{13}{21}$.

Practice

Find each sum or difference.

1. $\frac{4}{9} + \frac{2}{9}$
2. $\frac{3}{10} + \frac{6}{10}$
3. $\frac{7}{35} + \frac{18}{35}$
4. $\frac{9}{13} - \frac{4}{13}$
5. $\frac{14}{23} - \frac{8}{23}$
6. $\frac{33}{50} - \frac{18}{50}$

Math Skills Maintenance

Simplifying Fractions

Write each fraction in simplest form. Hint: Find the Greatest Common Factor of the numerator & denominator.

1. $\frac{28}{7}$	**2.** $\frac{9}{11}$	**3.** $\frac{6}{15}$ → 1, 2, (3) 6 / 1, (3) 5, 15 $\frac{6 \div 3}{15 \div 3} = \frac{2}{5}$
4. $\frac{18}{12}$	**5.** $\frac{5}{18}$	**6.** $\frac{4}{18}$
7. $\frac{27}{54}$	**8.** $\frac{76}{90}$	**9.** $\frac{3}{33}$
10. $\frac{8}{64}$	**11.** $\frac{15}{63}$	**12.** $\frac{42}{96}$
13. $\frac{1}{5}$	**14.** $\frac{24}{72}$	**15.** $\frac{25}{75}$
16. $\frac{63}{77}$	**17.** $\frac{12}{60}$	**18.** $\frac{24}{74}$