THE MATH PAK

Fractions and Decimals

FRACTION AND DECIMAL MATH PAK INSTRUCTIONS

Welcome to Math Team!

This package contains drills on fraction and decimal arithmetic. If you complete all these drills, you will be well on your way to Math Team! Here's what we want you to do:

1. Work each unit in order.

Work as many problems are you can in as many units as you can. You don't have to work all the problems in every unit. Just do your best!

- 2. Please don't use a calculator to work these problems.
- **3.** Check your answers with the answers in the answer page. If you missed any, try to figure out where you made your mistakes. If you still can't figure it out, ask your parents, or get someone to help you. Don/t erase! Just correct your problem over the old answer.
- 4. Turn in your completed Math Pak (complete with corrected problems) when Math Team begins!

Yay! You are on your way!

INTRODUCTION TO FRACTIONS

Fractions are expressed as one number over another number, like this: $\frac{1}{2}$

<== This mean a half of something!</pre>

The number on the top is called the *numerator* and the number on the bottom is called the *denominator*.

When you think of a fraction, think of a PIZZA!!

Suppose a pizza is cut evenly into the number of pieces in the DENOMINATOR. If the number of pieces YOU get is the NUMERATOR, the fraction of the pizza you get is:



Adding and taking away (subtracting) fractions can be pictured using slices of pizza. For example:



		Exa	am	ple 1:						Exa	m	ple 2:			
	1	1		1					1	1		1			
	X		- =	=					2	<	- =	:			
	2	2		4					2	3		6			
Means:	half	of	a	half	=	а	fourth!	Means:	half	of	а	third	=	а	sixth!

<u>Unit 1</u> show you how to do this multiplication.

INTRODUCTION TO FRACTIONS (CONTINUED)

DIVIDING FRACTIONS

Dividing fractions means determining how many smaller pieces there are in a larger piece. For example: $\frac{1}{-2}$ / $\frac{1}{-4}$ = 2 Means: one-half divided by one-fourth is 2 This means there are 2 one-fourth pieces of pizza in a half pizza.

<u>Unit 4</u> shows you how to do this division.

Here's another way to look at fractions. Imagine that you have a board and you want to cut it into halves, thirds, fourths, sixths, and fifths. Here is what those board fractions look like:

<=====================================						
	1/2 board			1/	2 board	l
1/4 board	1/4 board 1/4 board					
1/3 board	1	1/3 board		1/3	board	
1/6 board 1/	/6 board	1/6 board	1/6 boa	rd 1/6	board	1/6 board
1/5 board	1/5 board	1/5 boa	rd	1/5 boar	d	1/5 board

Notice that the 2 1/4th boards add up to a half board and that the 2 1/6 boards add up to a 1/3 board.

This means that there are 2 one-fourth boards in a half-board and that there are two one-sixth boards in a one-third board!

So now, let's begin!

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UNIT 1: FRACTION MULTIPLICATION

To multiply fractions, you multiply the <u>numerators</u> together and then multiply the <u>denominators</u> together. The numerator is the number on top and the denominator is the number on the bottom. The result (the "product") is always smaller than either of the original fractions.

EXAMPLES:

$\frac{1}{2} \times \frac{1}{2} = \frac{1 \times 1}{2 \times 2} = \frac{1}{4}$	$\frac{1}{8} \times \frac{3}{4} = \frac{1 \times 3}{8 \times 4} = \frac{3}{32}$
Means:	Means:
"one-half of one-half is one fourth"	"three fourths of one eighth is three thirty-seconds"

Multiply these fractions: (I will get you started with the first one)

31) T F h	This problem is pard!	$\frac{1}{50} \times \frac{1}{10} =$		32) This prob hard	plem is $\frac{12}{24}$	$\frac{26}{54} \times \frac{50}{61}$	=
28)	$\frac{4}{5} \times \frac{4}{5} =$:	29)	$\frac{5}{9} \times \frac{1}{3} =$		30)	This problem is hard! $\frac{1}{12} \times \frac{1}{12} =$
25)	$\frac{8}{9} \times \frac{1}{3} =$	2	26)	$\frac{7}{8} \times \frac{1}{4} =$		27)	$\frac{5}{6} \times \frac{5}{6} =$
22)	$\frac{1}{5} \times \frac{1}{5} =$	2	23)	$\frac{1}{12} \times \frac{1}{2} =$		24)	$\frac{1}{3} \times \frac{1}{5} =$
19)	$\frac{3}{5} \times \frac{1}{4} =$:	20)	$\frac{2}{7} \times \frac{1}{7} =$		21)	$\frac{3}{8} \times \frac{1}{4} =$
16)	$\frac{1}{8} \times \frac{3}{4} =$		17)	$\frac{1}{4} \times \frac{3}{4} =$		18)	$\frac{3}{8} \times \frac{1}{8} =$
13)	$\frac{1}{8} \times \frac{1}{2} =$		14)	$\frac{1}{4} \times \frac{1}{4} =$		15)	$\frac{1}{4} \times \frac{1}{8} =$
10)	$\frac{3}{11} \times \frac{1}{4} =$:	11)	$\frac{3}{5} \times \frac{1}{5} =$		12)	$\frac{1}{6} \times \frac{1}{8} =$
7)	$\frac{1}{9} \times \frac{1}{9} =$:	8)	$\frac{1}{9} \times \frac{1}{8} =$		9) $\frac{4}{8}$	$\frac{5}{3} \times \frac{7}{9} =$
4)	$\frac{1}{5} \times \frac{1}{4} =$:	5)	$\frac{1}{6} \times \frac{1}{2} =$		6) <u>-</u>	$\frac{1}{5} \times \frac{1}{6} =$
1)	$\frac{1}{2} \times \frac{1}{4} = \frac{1 \times 1}{2 \times 4}$	$\frac{1}{4} = -$		2) $\frac{1}{3} \times \frac{1}{3} =$		3)	$\frac{1}{3} \times \frac{1}{2} =$

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UNIT 2: FRACTION ADDITION- SAME DENOMINATORS

To a	To add fractions that have the same denominators, you just add the numerators (the top numbers). You keep the same denominator						
		You	DON'T add the denominator	s!			
$\begin{bmatrix} \mathbf{E}\mathbf{X} \\ \frac{1}{4} \end{bmatrix}$	AMPLES: $\frac{1}{4} = \frac{1+1}{4} = \frac{2}{4}$ <=====	= Don	't add denominators ====>		$\frac{1}{5} + \frac{3}{5} = \frac{1+3}{5} = \frac{4}{5}$		
Add	these fractions:						
1)	$\frac{1}{18} + \frac{1}{18} = \frac{1}{18}$	2)	$\frac{3}{5} + \frac{2}{5} = \frac{1}{5}$	3)	$\frac{1}{3} + \frac{1}{3} =$		
4)	$\frac{1}{8} + \frac{2}{8} =$	5)	$\frac{1}{9} + \frac{1}{9} =$	6)	$\frac{1}{16} + \frac{1}{16} =$		
7)	$\frac{1}{25} + \frac{1}{25} =$	8)	$\frac{1}{36} + \frac{4}{36} =$	9)	$\frac{1}{27} + \frac{3}{27} =$		
10)	$\frac{1}{56} + \frac{2}{56} =$	11)	$\frac{1}{21} + \frac{3}{21} =$	12)	$\frac{1}{18} + \frac{6}{18} =$		
13)	$\frac{1}{5} + \frac{1}{5} =$	14)	$\frac{3}{8} + \frac{4}{8} =$	15)	$\frac{1}{7} + \frac{3}{7} =$		
16)	$\frac{3}{11} + \frac{6}{11} =$	17)	$\frac{4}{6} + \frac{1}{6} =$	18)	$\frac{7}{81} + \frac{6}{81} =$		
19)	$\frac{16}{21} + \frac{1}{21} =$	20)	$\frac{5}{61} + \frac{8}{61} =$	21)	$\frac{2}{23} + \frac{11}{23} =$		
22)	$\frac{18}{23} + \frac{2}{23} =$	23)	$\frac{1}{17} + \frac{8}{17} =$	24)	$\frac{6}{15} + \frac{5}{15} =$		
25)	$\frac{6}{17} + \frac{4}{17} =$	26)	$\frac{9}{28} + \frac{10}{28} =$	27)	$\frac{4}{91} + \frac{5}{91} =$		
28)	$\frac{9}{11} + \frac{2}{11} =$	29)	$\frac{1}{2} + \frac{1}{2} =$	30)	This problem is hard! $\frac{126}{251} + \frac{126}{251} =$		
31) [This problem is $\frac{342}{831} + \frac{288}{831} =$ nard!		32) This problem is hard!	1251 2555	$+\frac{899}{2555}=$		

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UNIT 3: FRACTION SUBTRACTION - SAME DENOMINATORS

Fraction subtraction is similar to fraction addition. If the denominators are the same, just subtract the second numerator from the first one. The denominator stays the same. You *DON'T* subtract the denominators!

EX.	AMPLES:				
$\frac{3}{4}$	$-\frac{1}{4} = \frac{3-1}{4} = \frac{2}{4}$	===== Don't s	ubtract denominators! =	====>	$\frac{4}{5} - \frac{2}{5} = \frac{4-2}{5} = \frac{2}{5}$
4	4 4 4				
Subt	ract these fractions:				
1)	$\frac{4}{5} - \frac{1}{5} = \frac{1}{5}$	2)	$\frac{7}{8} - \frac{1}{8} = \frac{1}{8}$	3)	$\frac{5}{6} - \frac{1}{6} =$
4)	$\frac{3}{7} - \frac{1}{7} =$	5)	$\frac{5}{8} - \frac{3}{8} =$	6)	$\frac{7}{9} - \frac{2}{9} =$
7)	$\frac{9}{10} - \frac{1}{10} =$	8)	$\frac{9}{11} - \frac{1}{11} =$	9)	$\frac{15}{16} - \frac{1}{16} =$
10)	$\frac{9}{11} - \frac{7}{11} =$	11)	$\frac{15}{16} - \frac{11}{16} =$	12)	$\frac{11}{13} - \frac{9}{13} =$
13)	$\frac{8}{9} - \frac{7}{9} =$	14)	$\frac{5}{7} - \frac{4}{7} =$	15)	$\frac{6}{7} - \frac{4}{7} =$
16)	$\frac{14}{21} - \frac{9}{21} =$	17)	$\frac{55}{60} - \frac{50}{60} =$	18)	$\frac{11}{23} - \frac{8}{23} =$
19)	$\frac{17}{21} - \frac{13}{21} =$	20)	$\frac{27}{32} - \frac{22}{32} =$	21)	$\frac{81}{90} - \frac{80}{90} =$
22)	$\frac{44}{56} - \frac{22}{56} =$	23)	$\frac{14}{15} - \frac{11}{15} =$	24)	$\frac{13}{56} - \frac{9}{56} =$
25)	$\frac{21}{23} - \frac{11}{23} =$	26)	$\frac{18}{31} - \frac{9}{31} =$	27)	$\frac{11}{14} - \frac{9}{14} =$
28)	$\frac{58}{51} - \frac{26}{51} =$	29)	$\frac{77}{78} - \frac{58}{78} =$	30)	This problem is hard! $\frac{126}{255} - \frac{88}{255} =$
31)] I	This $\frac{811}{812} - \frac{188}{812}$	$\frac{3}{2} =$	32) This problem is hard!	$\frac{1241}{2560} - \frac{1}{2}$	899 2560 =

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UNIT 4: FRACTION DIVISION

To divide one fraction by another, you merely turn the second fraction upside-down (invert it) and then multiply! EXAMPLES:					
$\frac{\frac{1}{2} \cdot \frac{1}{3}}{\frac{1}{3}} = \frac{1}{2} \times \frac{3}{1} = \frac{3}{2}$ $\frac{1}{4} \cdot \frac{2}{5} = \frac{1}{4} \times \frac{5}{2} = \frac{5}{8}$	<=== Rewrite the whole problem as a multiply by inverting the second fraction, then multiplying =====>	Sometimes, fraction division problems look like this: $\frac{1/8}{1/4} = \frac{1}{8} \stackrel{\bullet}{\xrightarrow{\bullet}} \frac{1}{4} = \frac{1}{8} \times \frac{4}{1} = \frac{4}{8}$			

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Divide these fractions: (I'll invert the first two for you!) <u>Rewrite the whole problem as a multiply!</u>

1)	$\frac{1}{2} \stackrel{\bullet}{\bullet} \frac{1}{4} = \frac{1}{2} \times \frac{4}{1} =$	2)	$\frac{1}{2} \cdot \frac{3}{4} = \frac{1}{2} \times \frac{4}{3} =$
3)	$\frac{1}{3} \cdot \frac{1}{9} =$	4)	$\frac{1}{3} \cdot \frac{2}{9} =$
5)	$\frac{1}{5} \cdot \frac{1}{4} =$	6)	$\frac{1}{2} \cdot \frac{1}{9} =$
7)	$\frac{1}{4} \stackrel{\bullet}{\bullet} \frac{1}{8} =$	8)	$\frac{1}{4} \cdot \frac{8}{1} =$
9)	$\frac{3}{4} \cdot \frac{1}{2} \cdot \frac{8}{1} =$	10)	$\frac{1}{4} \cdot 8 =$
11)	$\frac{1}{2} \cdot \frac{1}{16} =$	12)	$\frac{3}{4} \cdot \frac{1}{16} =$
13)	$\frac{1/5}{2/10} =$	14)	$\frac{2}{5} \cdot \frac{1}{10} =$
15)	$\frac{3}{5} \cdot \frac{1}{10} =$	16)	$\frac{1}{4} \cdot \frac{8}{12} =$
17)	$\frac{1}{5}$ \div 10	18)	$\frac{3}{8} \cdot \frac{3}{1} =$
19)	$\frac{3}{8} \stackrel{\bullet}{\bullet} 3 =$	20)	$\frac{3/8}{8/5} =$
21)	$\frac{5}{8} \cdot \frac{1}{8} =$	22)	$\frac{5}{8} + \frac{5}{8} =$
23)	$\frac{7}{8} \cdot \frac{5}{8} =$	24)	This problem is hard! $\frac{16}{31} \cdot \frac{8}{81} =$

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UNIT 5: FRACTIONS: CHANGING DENOMINATORS

To change the denominator of a fraction to another number, divide the denominator you want by the denominator you have and then multiply by your numerator to get the new numerator. **EXAMPLES:** $\frac{1}{2} = \frac{?}{8} \stackrel{<==}{} \frac{4}{8}$ is the answer because $\frac{3}{4} = \frac{?}{8} \stackrel{<==}{} \frac{6}{8}$ is the answer because $\frac{3}{4} = \frac{?}{8} \stackrel{<==}{} \frac{6}{8}$ is the answer because $\frac{3}{4} = \frac{?}{8}$ because $\frac{3}{4} = \frac{2}{8}$ be

Change these fractions to their new denominators (fill in the missing number):

1)	$\frac{1}{2} = \frac{1}{4}$	2)	$\frac{1}{3} = \frac{1}{9}$	3)	$\frac{2}{3} = \frac{1}{9}$
	(4/2) = 2 and then 2 X 1 = what?				
4)	$\frac{1}{4} = \frac{1}{8}$	5)	$\frac{3}{4} = \frac{1}{8}$	6)	$\frac{1}{8} = \frac{1}{16}$
7)	$\frac{6}{8} = \frac{1}{16}$	8)	$\frac{5}{6} = \frac{1}{12}$	9)	$\frac{1}{8} = \frac{1}{32}$
10)	$\frac{1}{4} = \frac{1}{16}$	11)	$\frac{1}{9} = \frac{1}{18}$	12)	$\frac{2}{9} = \frac{1}{18}$
13)	$\frac{5}{8} = \frac{1}{16}$	14)	$\frac{9}{15} = \frac{1}{30}$	15)	$\frac{4}{15} = \frac{4}{30}$
16)	$\frac{9}{15} = \frac{1}{30}$	17)	$\frac{1}{32} = \frac{1}{64}$	18)	$\frac{12}{18} = \frac{12}{36}$
19)	$\frac{11}{44} = \frac{1}{88}$	20)	$\frac{9}{11} = \frac{1}{44}$	21)	$\frac{5}{16} = \frac{1}{32}$
22)	$\frac{15}{31} = \frac{15}{62}$	23)	$\frac{8}{9} = \frac{1}{81}$	24)	$\frac{5}{7} = \frac{1}{49}$
25)	$\frac{8}{16} = \frac{1}{64}$	26)	This problem is hard! $\frac{8}{211} = \frac{1}{422}$		

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UNIT 6: FRACTION ADDITION - DIFFERENT DENOMINATORS (PART 1)

To add fractions with different denominators, you must first change both denominators to be the same.	$\frac{\mathbf{EXAN}}{\frac{1}{2} + \frac{1}{4}}$	IPLES: change the	$\frac{1}{2}$	to	$\frac{2}{4}$	then add:	$\frac{2}{4} + \frac{1}{4} = \frac{3}{4}$
The denominator will be the LARGER of the 2 denominators.	$\frac{3}{8} + \frac{1}{4}$	change the	$\frac{1}{4}$	to	$\frac{2}{8}$	then add:	$\frac{3}{8} + \frac{2}{8} = \frac{5}{8}$

To do this you will need the skills you learned in Unit 5. Once you have both denominators the same, then you just add the numerators. If the denominator of one fraction divides evenly (no remainder) into the other, then change the fraction with the smaller denominator to a fraction with the larger denominator, then add numerators.

Add these fractions: (I will give you the first 3 common denominators!)

1)	$\frac{3}{4} + \frac{1}{2} = \frac{3}{4} + \frac{1}{4} =$	2) $\frac{1}{3} = \frac{1}{9}$	$=\frac{1}{9}+\frac{1}{9}=$	3)	$\frac{2}{3} = \frac{1}{9} = \frac{1}{9} + \frac{1}{9} =$
4)	$\frac{1}{4} + \frac{1}{8} =$	5) $\frac{1}{4} + \frac{3}{8}$	=	6)	$\frac{1}{4} + \frac{2}{8} =$
7)	$\frac{1}{5} + \frac{6}{10} =$	8) $\frac{1}{5} + \frac{7}{10}$	=	9)	$\frac{2}{5} + \frac{7}{10} =$
10)	$\frac{3}{5} + \frac{1}{10} =$	11) $\frac{3}{5} + \frac{2}{10}$	=	12)	$\frac{1}{16} + \frac{1}{32} =$
13)	$\frac{3}{4} + \frac{1}{8} =$	14) $\frac{1}{5} + \frac{1}{10}$	=	15)	$\frac{1}{5} + \frac{3}{10} =$
16)	$\frac{1}{4} + \frac{5}{16} =$	17) $\frac{1}{4} + \frac{7}{1}$	$\frac{7}{6} =$	18)	$\frac{3}{4} + \frac{3}{16} =$
19)	$\frac{3}{4} + \frac{5}{16} =$	20) $\frac{1}{16} + \frac{9}{3}$	$\frac{9}{2} =$	21)	$\frac{1}{16} + \frac{3}{32} =$
22)	$\frac{3}{16} + \frac{3}{32} =$	23) $\frac{1}{4} + \frac{1}{1}$	l 6 =	24)	$\frac{3}{4} + \frac{1}{16} =$
		These	3 problems are hard!		
25)	$\frac{3}{8} + \frac{1}{64} =$	$\frac{3}{9} + \frac{5}{81} =$	27) <u>126</u> <u>256</u>	+ 9/51	<u>-</u> =



Add these fractions:

(I will give you the first 3 common denominators!)

1)	$\frac{1}{4} + \frac{1}{6} = \frac{1}{24} + \frac{1}{24} + \frac{1}{24} = \frac{1}{24} + \frac{1}{24} = \frac{1}{24} + \frac{1}{24} = \frac{1}{24} + \frac{1}{24} = \frac{1}{24} + \frac{1}{24} + \frac{1}{24} = \frac{1}{24} + \frac{1}{24} + \frac{1}{24} = \frac{1}{24} + \frac{1}{24} + \frac{1}{24} + \frac{1}{24} + \frac{1}{24} = \frac{1}{24} + $	2) $\frac{1}{4}$	$+\frac{2}{6} = \frac{1}{24} + \frac{1}{24} =$	3)	$\frac{3}{4} + \frac{1}{3} = \frac{1}{12} + \frac{1}{12} =$
4)	$\frac{1}{4} + \frac{1}{5} =$	5)	$\frac{1}{4} + \frac{2}{5} =$	6)	$\frac{1}{4} + \frac{3}{5} =$
7)	$\frac{3}{4} + \frac{3}{6} =$	8) $\frac{2}{2}$	$\frac{3}{4} + \frac{2}{5} =$	9)	$\frac{3}{4} + \frac{3}{5} =$
10)	$\frac{3}{4} + \frac{4}{5} =$	11)	$\frac{1}{5} + \frac{1}{6} =$	12)	$\frac{1}{5} + \frac{2}{6} =$
13)	$\frac{2}{5} + \frac{1}{6} =$	14)	$\frac{3}{5} + \frac{1}{6} =$	15)	$\frac{3}{4} + \frac{1}{5} =$
16)	$\frac{4}{5} + \frac{1}{6} =$	17)	$\frac{1}{5} + \frac{5}{6} =$	18)	$\frac{1}{8} + \frac{1}{7} =$
19)	$\frac{1}{8} + \frac{3}{7} =$	20)	$\frac{5}{6} + \frac{6}{8} =$	21)	$\frac{8}{11} + \frac{5}{8} =$
22)	$\frac{15}{13} + \frac{8}{11} =$				

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UNIT 8: FACTORING

To <i>'factor'</i> a number means to break it up into numbers that can be multiplied together to get the original number.					
EXAMPLES:					
6 = 3 X 2 <== The factors of 6 are 3 and 2	Sometimes, numbers can be factored into different combinations.				
9 = 3 X 3 <== The factors of 9 are 3 and 3	For example: 8 = 4 X 2 and 2 X 2 X 2				
Two different ways to factor: How about 18? 18 = 9 X 2 or 6 X 3					

Factor the following numbers. I will factor the first one for you!

1)	10 = 5 X 2	2) 1	5 =	3)	20 =
4)	21 =	5) 2	2 =	6)	4 =
7)	12 =	8) 1	4 =	9)	26 =
10)	27 =	11)	25 =	12)	30 =
13)	28 =	14)	50 =	15)	33 =
16)	34 =	17)	70 =	18)	46 =
19)	39 =	20)	This problem is hard!	21)	This problem is hard!
			169 =		95 =

22) This problem is hard!

221 =

EXAMPLES:

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UNIT 9: FRACTIONS - REDUCING TO LOWEST TERMS

Sometimes the numerator of a fraction will divide evenly into the denominator. The fraction can be reduced by replacing the numerator with a 1 and dividing the original denominator by the numerator to get a new denominator.

 $\frac{2}{4} = \frac{1}{2}$ because 4/2 = 2 $\frac{2}{6} = \frac{1}{3}$ because 6/2 = 3

Fractions in which the numerator and denominator contain the same factor can also be reduced by removing the common factor from both the numerator and the denominator.

EXAMPLES: 6 $\Im \times 2$	The 3s cancel because they	21_\X×3	The 7s cancel and you
$\overline{9} = \overline{3 \times 3}$	are in both the numerator and	<u>28</u> – <u>∖</u> X×4	get:
	the denominator, and you get		3/4
	2/3		

Reduce these fractions to their lowest terms: (I will give you the common factors for the first 3 problems!)

2) 1) $\frac{10}{15} = \frac{5 \times 2}{5 \times 3} =$ 3) $\frac{4}{8} =$ (common factor is 5) (common factor is 4) (common factor is 6) $\frac{6}{8} =$ 4) 5) 6) $\frac{12}{18} =$ $\frac{9}{27} =$ $\frac{6}{18} =$ 7) $\frac{6}{10} =$ 8) $\frac{6}{14} =$ 9) $\frac{3}{9} =$ 12) 10) 11) $\frac{6}{20} =$ $\frac{8}{16} =$ $\frac{5}{25} =$ $\frac{5}{20} =$ $\frac{5}{30} =$ 13) 14) 15)

	20		50
17)	$\frac{10}{14} =$	18)	$\frac{12}{14} =$
20)	$\frac{7}{14} =$	21)	$\frac{6}{16} =$

23)
$$\frac{5}{15}$$
 = **24)** $\frac{18}{27}$

=

26) This problem is $\frac{55}{66} =$ hard!

16)

19)

22)

 $\frac{25}{36} =$

 $\frac{10}{12} =$

 $\frac{8}{14} =$

 $\frac{3}{15} =$

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UNIT 10: 1	FRACTIONS - N	AIXED NUMBERS			
A fraction These are	in which the nun improper fraction	nerator is larger than	the denominator is called	d an <i>i<u>mproper fraction</u></i>	
	$\frac{10}{8}$	$\frac{12}{6}$	$\frac{15}{9}$	$\frac{21}{10}$	
Fractions to it. You making a to The above	ike these can be purn an improper fraction that goes improper fractio	turned into <u>mixed nu</u> fraction into a mixed with it (if there is on ns change into mixed	<i>mbers</i> . A mixed number number by dividing the e) by putting the remain numbers by dividing th	is a whole number wit numerator by the denor der over the denominat e numerator by the den	h a fraction added minator and or. ominator, like this:

$\frac{10}{8}$ $\frac{12}{6}$		15 9	$\frac{21}{10}$	
$ \begin{array}{r} \frac{1}{8 \mid 10} = 1 \frac{2}{8} \\ \frac{8}{2} \leftarrow \text{remainder} \end{array} $	$ \begin{array}{c} 2\\ 6 \hline 12\\ \underline{12}\\ 0 \\ \hline 0 \\ $	$9 \frac{1}{15} = 1 \frac{6}{9}$ $\frac{9}{6} \frac{1}{6}$ remainder	$ \begin{array}{cccc} 2 \\ 10 & 21 \\ & = 2 & 1/10 \\ & \frac{20}{1} & \uparrow \\ & 1 & <-remainder \end{array} $	

Turn these improper fractions into mixed numbers:

1)	$\frac{20}{8} =$		2) 6		3) 6
	Hint: 8 goes into 20 how many What is left over?	times?	4		= 5
4)	$\frac{12}{8} =$	5)	$\frac{12}{9} =$	6)	$\frac{12}{10} =$
7)	$\frac{12}{11} =$	8)	$\frac{18}{6} =$	9)	$\frac{18}{7} =$
10)	$\frac{18}{8} =$	11)	$\frac{18}{9} =$	12)	$\frac{25}{12} =$
13)	$\frac{25}{13} =$	14)	$\frac{7}{4} =$	15)	$\frac{7}{3} =$
16)	$\frac{7}{2} =$	17)	This problem is hard! $\frac{50}{8} =$	18)	This problem is hard! $\frac{250}{9}$ =

Name:	Parent:	Points			
UNIT 11: FRAG	CTIONS - MULTIPLYING	MIXED NUMBERS			
To multiply <u>mi</u> you must first o To convert a m number and th	xed numbers by any other is convert the mixed number to ixed number to an imprope en add the numerator to ge	number (fraction, who to an <u>improper fraction</u> er fraction, you multij t your new numerato writ 10	ole number or <u>on.</u> ply the denom r. The denom	another mixed number inator by the whole inator stays the same.	r)
EXAMPLES:	$5\frac{1}{8} = \frac{8 \times 5 + 1}{8} = \frac{41}{8}$ think about this:	$2\frac{3}{5} = \frac{5 \times 2 + 3}{5} =$	= <u>13</u> 4.	$\frac{1}{3} = \frac{3 \times 4 + 1}{3} = \frac{13}{3}$	
 Take the f How man (Each who) Add 1 to g 	first mixed number: 5 1/8 y 8ths are there in 5? The ole number has 8 8ths.) get 41/8ths.	th. re are 40 of them.			
WARNING: IT MULTIPLY TH AND THE FRA	DOESN'T WORK TO JUST E WHOLE NUMBERS CTIONS SEPARATELY!	$\rightarrow 2\frac{1}{2} \times 2\frac{1}{2}$ IS 1	NOT 2×2	$+ \frac{1}{2} \times \frac{1}{2} = 4 + \frac{1}{4}$	

Multiply the following: (I will convert the first mixed number for you!)

1) $1\frac{1}{3} \times 2 = \frac{4}{3} \times \frac{2}{1} = -$

Note: the 2 becomes 2/1 as a fraction

- **2)** $3\frac{1}{8} \times \frac{1}{2} = ---- \times ---- = ----$
- **4)** $3\frac{2}{3} \times \frac{1}{4} = ----- \times ---- = -----$
- **6)** $4\frac{1}{3} \times 2\frac{1}{2} = ---- \times ---- = ----$
- **8)** $2\frac{1}{2} \times 2\frac{1}{2} = ---- \times ---- = ----$
- **10)** 4 $\frac{1}{8} \times 4 \frac{1}{8} = ---- = ----$

- **3)** $2\frac{1}{6} \times \frac{1}{3} = ---- \times ---- = -----$
- **5)** $6\frac{1}{5} \times \frac{1}{3} = ----- \times ---- = -----$
- **7)** $6\frac{4}{5} \times 1\frac{1}{2} = ----- \times ---- = -----$
- **9)** $2 \times 3\frac{1}{2} = ---- \times ---- = -----$
- **11)** This problem is hard! $15\frac{1}{2} \times 15\frac{1}{2} = ----- \times ---- = -----$

Decim	nals						file:///C:/math/m
Name	e:	Parent	t:		Points:		_
UNIT	Г 12: INTROI	DUCTION TO	DECI	MALS			
		Decimal	s are n	umbers tha	t contain a deci	mal point, l	like:
1.5	2.8	.2	3.1	4	66.66		· · · · 、
The 1 The 1 that a	number to the l number to the r are added to the	right of the decin right of the decine whole numbe	nal poin imal is r to the	nt is an <u>inte</u> called the ' left of the	eger (positive or 'tenths" digit an decimal point. S	d tells you So	whole number or zero). the number of tenths (1/10's)
1.5 i as th num	s the same 1e mixed 1ber	$1 \text{ and } \frac{5}{10}$,	or 1 $\frac{5}{10}$	$\frac{1}{2}$ 2.8 is	$2 \text{ and } \frac{8}{10}$, or	$r = 2 \frac{8}{10}$.2	2 is $\frac{2}{10}$
If the are th	ere are 2 numb he number of "	ers to the right hundredths" (1)	of the d (100's)	lecimal poi to be addec	nt then both num l to the whole n	mbers to th umber, so	e right of the decimal point
3.14 the 1	is the same as mixed number	5 3 and $\frac{14}{100}$, or 3	$\frac{14}{100}$	66.66 is the as the mixed	same I number	66 and $\frac{66}{100}$, or 66 $\frac{66}{100}$
Conv	ert these decim	nals to mixed m	umbers	:			
1)	1.6 =		2)	2.9 =		3)	14.4 =
4)	16.17 =		5)	22.88 =		6)	This problem is hard! 1.04 =
Conv	vert these mix	ed numbers to	decim	als:			
7)	4 6 10		8)	$2\frac{3}{10}$		9)	6 8 10
10)	9 <u>56</u> 100		11)	15 <mark>88</mark> 100		12)	This problem is hard! 88 <u>5</u> 100

Name:	Parent:		Points:	
UNIT 13: DECI	MAL ADDITION			
To add decimal	s, you must write one a	bove the other with	their decim	al points lined up, like this:
	1.5 <u>+ 2.6</u>	8.95 <u>+ 1.9</u> :	44.91 <u>⊦.2</u>	14. + .04
Where one deci	mal doesn't have digits	that the other one	does, you pu	t in zeroes, like this:
	1.5 <u>+ 2.6</u>	8.95 <u>+ 1.90</u> _	44.91 ⊦ 00.20	14.00 <u>+ 00.04</u>
Now, its easy! Y but you keep tra the two number	You just add the two nu ack of where the decima s being added, like this	mbers as you woul al point goes and p :	d two whole ut it in the re	numbers, with carries if necessary, sult right under the decimal points in
<u>+</u>	1.5 8.95 2.6 + 1.90 4.1 10.85	44.91 <u>+ 00.20</u> 45.11	14.00 <u>+ 00.04</u> 14.04	
Add these decin	nals: (I will line up the	e first decimal for	vou!)	
1) $2.2 + 1.1$		2)	4.4 + 8.8	

3) $9.09 + .2$	4)	16. + 1.05
----------------	----	------------

5)	2 + 1.55	6)	This problem is hard!
	$.5 \pm 1.55$		9.99 ± 100.99

Fractions and Decimals

Name: ______ Parent: _____ Points: _____

UNIT 14: DECIMAL SUBTRACTION

Decimal subtraction is similar to decimal other with their decimal points lined up. T with borrows if necessary, but you bring o	addition. You Fhen you jus lown the dec	ı write down bo t substract as yo imal point like y	th decimals one above the u would 2 whole numbers, ou did with decimal addition.
	EXAMPL	ES:	
23.06	1.44	2.3	
- <u>14.07</u>	- 0.06	- <u>0.8</u>	
8.99	1.38	1.5	

Subtract these decimals: (Allow me to line up the first one!)

1)	2.3 - 1.1 =	2)	44.22
	2.3 - <u>1.1</u>		
3)	9.31 - 1.2	4)	6.66 - 4.48
5)	16.23 - 1.4	6)	1.061
7)	144.2 - 128.3	8)	29 - 1.4

- 9) 14.4 - 13.9 10) 18.1 - 1.44
- 12) This problem is hard! 11) 32.6 - 2.88 .228 - .01

Name:

Parent:_____ Points: ____

UNIT 15: DECIMAL MULTIPLICATION

To multiply 2 decimals, you merely multiply the 2 numbers together, ignoring the decimal points. Then, when you have your answer (called the "product"), you add the number of digits to the right of the decimal point in each number together and place the decimal in your answer (product) that many places from the RIGHT.



Multiply these decimals (don't use your calculator and DON'T LINE UP THE DECIMAL POINTS!):

1) 3.6 < × <u>1.3</u>	- (3×1=3, so your answer should be close to 3)	2) 18.2 < (18× × <u>1.1</u> so you should	1=18, # answer i be close to 18)
3)	4)	5)	6)
1.2	8.6	11.22	4.44
× 9.	<u>× 4.4</u>	×4	× 1.6
7)	8)	9) This problem is hard!	
. 44	. 49	. 12	
<u>× 6.</u>	× <u>. 06</u>	× 06	

Fractions and Decimals

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Name: Parent: Points:

UNIT 16: DECIMAL DIVISION

Here's how you divide one decimal by another: Suppose you want to divide 4.5 by 1.8 First, you write your problem as you normally would:

Next, you move the decimals in both the numbers to the right the same number of times until the divisor is a whole number.

divisor
$$\longrightarrow 1.8 4.5$$

The decimal point in your answer will be lined up with the one in the number you are dividing into. Now, you do your division:

$$18.) 45.$$

$$36$$
9
 remainder

Next, if you have a remainder, bring down a zero from the number being divided and continue:

$$\begin{array}{c}
2.5 \\
18. \overline{\smash{\big)}45.0} \\
\underline{36} \\
9 \\
0 \\
\underline{9 \\ 0} \\
0 \\
\hline
0 \\
\hline
\end{array} \text{ no remainder}$$

Check your answer for reasonableness by ignoring the part past the decimal and dividing in your head! For example, in this last problem 45/18 is about 2 so the answer should be near 2.

Divide these decimals: (These problems are all hard but don't use your calculator!)

 $(3)_{4.0} = 5.0$ 1) 2) 1.1) 5.5 2.4 8.4

4) 5) 6) .04)1.88 2.0) 15.5 8.8) .440

Congratulations! You have finished!

.

MATH PAK ANSWERS

UNIT 1:	UNIT 2:	UNIT 3:	UNIT 4:
FRACTION	FRACTION ADDITION	FRACTION	FRACTION
MULTIPLICATION	SAME	SUBTRACTION	DIVISION
	DENOMINATORS	SAME DENOMINATORS	
1. 1/8			1. 4/2 or 2
2. 1/9	1. 2/18 or 1/9	1. 3/5	2. 4/6 or 2/3
3. 1/6	2. 1	2. 6/8 or 3/4	3. 9/3 or 3
4. 1/20	3. 2/3	3. 4/6 or 2/3	4. 9/6 or 1 1/2
5. 1/12	4. 3/8	4. 2/7	5. 4/5
6. 1/36	5. 2/9	5. 2/8 or 1/4	6. 9/2 or 4 1/2
7. 1/81	6. 2/16 or 1/8	6. 5/9	7. 8/4 or 2
8. 1/72	7. 2/25	7. 8/10 or 4/5	8. 1/32
9. 35/72	8. 5/36	8. 8/11	9. 3/32
10. 3/44	9. 4/27	9. 14/16 or 7/8	10. 1/32
11. 3/25	10. 3/56	10. 2/11	11. 16/2 or 8
12. 1/48	11. 4/21	11. 4/16 or 1/4	12. 48/4 or 12
13. 1/16	12. 7/18	12. 2/13	13. 10/10 or 1
14. 1/16	13. 2/5	13. 1/9	14. 20/5 or 4
15. 1/32	14. 7/8	14. 1/7	15. 30/5 or 6
16. 3/32	15. 4/7	15. 2/7	16. 12/32 or 3/8
17. 3/16	16. 9/11	16. 5/21	17. 1/50
18. 3/64	17. 5/6	17. 5/60 or 1/12	18. 3/24 or 1/8
19. 3/20	18. 13/81	18. 3/23	19. 3/24 or 1/8
20. 2/49	19. 17/21	19. 4/21	20. 15/64
21. 3/32	20. 13/61	20. 5/32	21. 25/64
22. 1/25	21. 13/23	21. 1/90	22. 40/40 or 1
23. 1/24	22. 20/23	22. 22/56 or 11/28	23. 56/40 or 1 2/5
24. 1/15	23. 9/17	23. 3/15 or 1/5	24. 1296/248 or 5
25. 8/27	24. 11/15	24. 4/56 or 1/14	7/31
26. 7/32	25. 10/17	25. 10/23	
27. 25/36	26. 19/28	26. 9/31	
28. 16/25	27. 9/91	27. 2/14 or 1/7	
29. 5/27	28. 11/11 or 1	28. 32/51	
30. 1/144	29. 2/2 or 1	29. 19/78	
31. 1/500	30. 252/251 or 1 1/251	30. 38/255	
32. 6300/15494	31. 630/831	31. 623/812	
	32. 2150/2555	32. 342/2560	

UNIT 5:	UNIT 6:	UNIT 7:	UNIT 8:
FRACTIONS:	FRACTION ADDITION:	FRACTION ADDITION:	FRACTIONS:
CHANGING	DIFFERENT	DIFFERENT	FACTORING
DENOMINATORS	DENOMINATORS	DENOMINATORS	
	(Part 1)	(Part 2)	1. 5 x 2
1. 2/4			2. 5 x 3
2. 3/9	1. 5/4 or 1 1/4	1. 10/24 or	3. 5 x 2 x 2
3. 6/9	2. 4/9	5/12	or
4. 2/8	3. 7/9	2. 14/24 or	5 x 4
5. 6/8	4. 3/8	7/12	4. 7 x 3
6. 2/16	5. 5/8	3. 13/12 or	5. 11 x 2
7. 12/16	6. 4/8 or 1/2	1 1/12	6. 2 x 2
8. 10/12	7. 8/10 or 4/5	4. 9/20	7. 4 x 3 or
9. 4/32	8. 9/10	5. 13/20	2 x 2 x 3
10. 4/16	9. 11/10 or 1 1/10	6. 17/20	8. 7 x 2
11. 2/18	10. 7/10	7. 30/24 or	9. 13 x 2
12. 4/18	11. 8/10 or 4/5	1 1/4	10. 9 x 3 or
13. 10/16	12. 3/32	8. 23/20 or	3 x 3 x 3
14. 18/32	13. 7/8	1 3/20	11. 5 x 5
15. 8/30	14. 3/10	9. 27/20 or	12. 5 x 6 or
16. 18/30	15. 5/10 or 1/2	1 7/20	5 x 3 x 2
17. 2/64	16. 9/16	10. 31/20 or	13. 7 x 4 or
18. 24/36	17. 11/16	1 11/20	7 x 2 x 2
19. 22/88	18. 15/16	11. 11/30	14. 10 x 5 or
20. 36/44	19. 17/16 or 1 1/16	12. 16/30 or	5 x 5 x 2
21. 10/32	20. 11/32	8/15	15. 11 x 3
22. 30/62	21. 5/32	13. 17/30	16. 17 x 2
23. 72/81	22. 9/32	14. 23/30	17. 7 x 10 or
24. 35/49	23. 5/16	15. 19/20	7 x 5 x 2
25. 32/64	24. 13/16	16. 29/30	18. 23 x 2
26. 16/422	25. 25/64	17. 31/30 or 1 1/30	19. 13 x 3
	26. 32/81	18. 15/56	20. 13 x 13
	27. 261/512	19. 31/56	21. 19 x 5
		20. 76/48 or	22. 17 x 13
		1 7/12	
		21. 119/88 or	
		1 31/88	
		22. 269/143 or	
		1 126/143	

UNIT 9:	UNIT 10:	UNIT 11:	UNIT 12:
FRACTIONS:	FRACTIONS:	FRACTIONS:	INTRODUCTION
REDUCING TO	MIXED NUMBERS	MULTIPLYING MIXED NUMBERS	TO DECIMALS
LOWEST TERMS			
	1. 2 4/8 or	1. 8/3 or	1. 1 6/10 or
1. 2/3	2 1/2	2 2/3	1 3/5
2. 1/2	2. 1 2/4 or	2. 25/16 or	2. 2 9/10
3. 1/2	1 1/2	1 9/16	3. 14 4/10 or
4. 1/3	3. 1 1/5	3. 13/18	14 2/5
5. 2/3	4. 1 4/8 or	4. 11/12	4. 16 17/100
6. 3/4	1 1/2	5. 31/15 or	5. 22 88/100 or
7. 3/5	5. 1 3/9 or	2 1/15	22 22/25
8. 3/7	1 1/3	6. 65/6 or	6. 1 4/100 or
9. 1/3	6. 1 2/10 or	10 5/6	1 1/25
10. 3/10	1 1/5	7. 102/10 or	7. 4.6
11. 1/2	7. 1 1/11	10 1/5	8. 2.3
12. 1/3	8.3	8. 25/4 or	9. 6.8
13. 1/4	9. 2 4/7	6 1/4	10. 9.56
14. 1/5	10. 2 2/8 OR	9. 14/2 or 7	11. 15.88
15. 1/6	2 1/4	10. 1089/64 or	12. 88.05
16. 5/6	11. 2	17 1/64	
17. 5/7	12. 2 1/12	11. 961/4 or	
18. 6/7	13. 1 12/13	240 1/4	
19. 4/7	14. 1 3/4		
20. 1/2	15. 2 1/3		
21. 3/8	16. 3 1/2		
22. 1/5	17. 6 2/8 or		
23. 1/3	6 1/4		
24. 2/3	18. 27 7/9		
25. 1/2			
26. 5/6			

UNIT 13:	UNIT 14:	UNIT 15:	UNIT 16:
DECIMAL	DECIMAL	DECIMAL	DECIMAL
ADDITION	SUBTRACTION	MULTIPLICATION	DIVISION
1. 3.3 2. 13.2 3. 9.29 4. 17.05 5. 1.85 6. 110.98	1. 1.2 2. 44. 3. 8.11 4. 2.18 5. 14.83 6. .96 7. 15.9 8. 27.6 9. .5 10. 16.66 11. 29.72 12. .218	1. 4.68 2. 20.02 3. 10.8 4. 37.84 5. 4.488 6. 7.104 7. 2.64 80294 90072	1. 5.0 or 5 2. 3.5 3. 1.25 4. 7.75 5. 47. 605