Summer Preparation

Pre-Algebra 7

Summer Preparation Self-Directed Course
Pre-Algebra 7

In this packet, you will find:

- ✓ Worksheets to be used for practice
- ✓ Quizzes to check for understanding
- ✓ Answer keys

The objective of this material is to strengthen the skills necessary for success in Pre-Algebra 7. It is geared toward students moving from sixth grade mathematics into seventh grade accelerated mathematics. Students need to be fluent in both decimal and fraction computation *without* the aid of a calculator, as well as word problems incorporating these topics. They also need to have a solid understanding of integer operations involving negative numbers such that they can answer accurately without the use of a calculator. Manipulating problems with absolute values is an important topic in Pre-Algebra 7 that is also reviewed in this packet.

Good Luck and Have A Great Summer!!!

Decimals Review

Addition and Subtraction:

Line up the decimal points. Then add or subtract as with whole numbers and bring down the decimal point. Annex (add on) extra zeros as needed so that both numbers are the same length.

Example 1: Add. 7.45 + 8.8

7.45 Line up the decimal points vertically.
+ 8.80 Write extra zeros as needed. Add.
16.25 Line up the decimal points.

Example 2: Subtract. 14.2 – 6.784

14.200 Line up the decimal points vertically.
– 6.784 Write extra zeros as needed. Subtract.
7.416 Line up the decimal points.

Multiplication:

The number of decimal places in the product is equal to the total number of decimal places in the factors. You do NOT need to line up the decimal points or add more zeros.

Example 1: Multiply. 4.253 × 8

4.253 Count the decimal places in each factor.
× 8
34.024 The product has three decimal places.

Example 2: Multiply. $12.25 × 0.07

$12.50 two decimal places
× 0.07 two decimal places
$0.8750 four decimal places (answer $0.88)

Division:

If the divisor (number outside the box) is a whole number, write a decimal point in the quotient (number above the box) directly above the decimal point in the dividend (number inside the box). If the divisor is a decimal number, move the decimal point to the right until the divisor is a whole number. Then move the decimal in the dividend the same number of places to the right. Write a decimal point in the quotient directly above the new decimal point in the dividend.

Example 1: Divide $1.98 by 4. Round to the nearest cent.

0.495	
4)1.980	Write zeros in the dividend to keep going
-0	4×0 = 0
19	
-16	4×4 = 16
38	
-36	4×9 = 36
20	
-20	4×5 = 20
0	Answer: $0.495 rounds to $0.50 as the nearest cent!

Don't forget to check your answer for reasonableness! $0.495 \times 4 = 1.98$

Example 2: Divide 318 by 0.6
Move the decimal in the divisor until you get a whole number.
Then move the decimal point in the dividend the same number of places.

0.6)318	becomes	530	
		6) 3180	
		-30	6×5 = 30
		18	
		-18	6×3 = 18
		00	
		-0	6×0 = 0
		0	

Don't forget to check your answer for reasonableness! $530 \times 0.6 = 318$

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DECIMALS REVIEW

ADD: 3.68 + 0.94	12.8 + 4.41	24.24 + 5.29
59.3 + 21.512	14.99 + 21.312	$7.25 + $19.99
106.7 + 0.205	25.8 + 19.5	$15.60 + $25.06
SUBTRACT: 8.762 – 0.381	9.4 – 5.73	52.52 – 25.25
17.001 – 5.5	$40.00 - $26.83	15.72 – 8.406
273.85 – 78.31	46 – 0.23	32.08 – 7.68

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DECIMALS REVIEW

MULTIPLY: 3.2×5.1	0.05×9	3.1×0.3
0.6×0.009	2.139×7.2	34.24×6.6
38.175×1.2	0.61×4.8	$\$180.00 \times 0.35$
DIVIDE: $6.52 / 4$	$0.088 / 8$	$51 / 0.3$
$19.05 / 0.05$	$7.35 / 2.1$	$73.78 / 1.4$
$1.6932 / 2$	$2.05 / 0.5$	$\$12.89 / 4$

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DECIMAL WORD PROBLEMS REVIEW

Show all work and steps necessary to solve each problem below.

1.) The art department needs craft supplies. They bought beads for $12.75, ribbon for $4.50, felt for $0.99, and leather cord for $6.35. How much money did they spend altogether on craft supplies? If they would like to pay with $30.00, how much change will they receive back?

2.) You have $98 in your savings account. You withdraw $5.50 and deposit $22.75. What is the new balance in your account?

3.) Mrs. Streit bought twenty-four folders for her students. The folders cost $0.79 each. What was the cost of Mrs. Streit's folders? If there is 8% sales tax on the folders, multiply your answer by 0.08 to find the sales tax. What is the total cost, including tax, of the folders?

4.) A dozen eggs cost $1.29. Find the cost of one egg. If a recipe for brownies calls for four eggs, how much will the eggs used in the recipe cost?

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DECIMAL WORD PROBLEMS REVIEW

Show all work and steps necessary to solve each problem below.

5.) In the three days after Jimmy Carter was elected President of the United States, the Dow Jones stock average had the following daily changes: Wednesday, -9.56 points; Thursday, +3.91 points; Friday, -17.37 points. What was the net change for the three days?

6.) One sheet of paper is 0.0075 centimeters thick. How many sheets are there in a stack 2.7 centimeters high? If a ream of paper holds 500 sheets of paper, how tall is a ream of paper?

7.) A taxicab company charges $1.75 for the first mile and $1.25 for each mile after that. How much would a ten-mile ride cost? If the rider only has a twenty dollar bill to pay with, how much change will he receive?

8.) Mike wants to buy a bike that costs $210.95. He plans to make a down payment of $75.00. He will pay the rest of the cost in five equal payments over the next five months. How much will each payment be?

Fractions Review

Addition & Subtraction

To add or subtract fractions with like denominators, add or subtract the numerators and keep the same denominator. Then write the answer in simplest form. (Simplest form means that the numerator and denominator cannot be divided by the same number, other than one. They have no other factors in common other than one.)

$$\frac{3}{4}+\frac{3}{4}=\frac{3+3}{4}=\frac{6}{4}=1\frac{2}{4}=1\frac{1}{2}$$

$$\frac{7}{10}-\frac{3}{10}=\frac{7-3}{10}=\frac{4}{10}=\frac{2}{5}$$

To add or subtract fractions with unlike denominators, find the Least Common Multiple so that you can write the fractions with like denominators. Then add or subtract the fractions. Simplify your answer if necessary.

Add two thirds and one fourth. (LCM of denominators is 12)

$$\frac{2}{3}\times\frac{4}{4}=\frac{8}{12} \qquad \frac{1}{4}\times\frac{3}{3}=\frac{3}{12}$$

$$\frac{2}{3}+\frac{1}{4}=\frac{8}{12}+\frac{3}{12}=\frac{8+3}{12}=\frac{11}{12}$$

Subtract two fifths from seven eighths. (LCM of denominators is 40)

$$\frac{7}{8}\times\frac{5}{5}=\frac{35}{40} \qquad \frac{2}{5}\times\frac{8}{8}=\frac{16}{40}$$

$$\frac{7}{8}-\frac{2}{5}=\frac{35}{40}-\frac{16}{40}=\frac{35-16}{40}=\frac{19}{40}$$

If adding or subtracting with mixed numbers, write the fractions with like denominators before performing any operation. You may need to rename the first fraction before subtracting.

Multiplication and Division

To multiply fractions, multiply the numerators and multiply the denominators. To multiply a fraction and a whole number, first write the whole number as a fraction. Write the product in simplest form.

$$\frac{3}{4} \times \frac{2}{5} = \frac{3\times2}{4\times5} = \frac{6}{20} = \frac{3}{10} \qquad \frac{1}{2} \times 18 = \frac{1}{2} \times \frac{18}{1} = \frac{1\times18}{2\times1} = \frac{18}{2} = 9$$

To divide fractions, multiply by the reciprocal of the second fraction. (A reciprocal is written by switching the numerator and the denominator.) Write the answer in simplest form.

$$\frac{5}{8} \div \frac{3}{4} = \frac{5}{8} \times \frac{4}{3} = \frac{20}{24} = \frac{5}{6} \qquad 6 \div \frac{2}{3} = \frac{6}{1} \times \frac{3}{2} = \frac{18}{2} =$$

To multiply or divide mixed numbers, write each mixed number as an improper fraction. Then proceed with the steps for multiplication or division. Write the answer in simplest form.

$$2\frac{5}{8} \times 3\frac{1}{3} = \frac{21}{8} \times \frac{10}{3} = \frac{cross}{cancel} = \frac{7}{4} \times \frac{5}{1} = \frac{35}{4} = 8\frac{3}{4}$$

$$10 \div 1\frac{2}{3} = \frac{10}{1} \div \frac{5}{3} = \frac{10}{1} \times \frac{3}{5} = \frac{cross}{cancel} = \frac{2}{1} \times \frac{3}{1} = \frac{6}{1} = 6$$

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FRACTIONS REVIEW

ADD:

$\frac{14}{15}+\frac{11}{15}$	$\frac{2}{5}+\frac{4}{5}$
$\frac{5}{9}+\frac{7}{12}$	$\frac{1}{6}+\frac{7}{10}$
$\frac{1}{3}+\frac{3}{4}$	$\frac{7}{8}+\frac{3}{20}$
$1\frac{1}{4}+3\frac{2}{3}$	$4\frac{3}{8}+1\frac{1}{2}$
$10\frac{6}{7}+2\frac{6}{14}$	$1\frac{2}{5}+3\frac{4}{5}$

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FRACTIONS REVIEW

SUBTRACT:

$\frac{6}{7} - \frac{4}{7}$	$\frac{11}{12} - \frac{5}{12}$
$\frac{7}{8} - \frac{1}{2}$	$\frac{15}{16} - \frac{5}{24}$
$\frac{5}{14} - \frac{1}{4}$	$\frac{1}{3} - \frac{5}{18}$
$4\frac{1}{4} - 3\frac{1}{2}$	$8 - 2\frac{4}{5}$
$7\frac{4}{9} - 2\frac{5}{9}$	$3\frac{7}{8} - 1\frac{1}{2}$

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FRACTIONS REVIEW

MULTIPLY:

$\frac{1}{2} \times \frac{4}{5}$	$\frac{3}{5} \times 20$
$\frac{3}{8} \times \frac{3}{4}$	$\frac{7}{10} \times \frac{4}{7}$
$\frac{1}{4} \times 6\frac{1}{2}$	$2\frac{2}{3} \times 2\frac{3}{8}$
$1\frac{1}{10} \times 5$	$3\frac{3}{10} \times 2\frac{2}{3}$
$5\frac{1}{4} \times 4\frac{2}{3}$	$10 \times 3\frac{2}{5}$

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FRACTIONS REVIEW

DIVIDE:

$\frac{1}{2} \div \frac{2}{3}$	$\frac{2}{5} \div \frac{4}{5}$
$9 \div \frac{1}{3}$	$12 \div \frac{3}{4}$
$4\frac{2}{9} \div \frac{1}{3}$	$3\frac{5}{8} \div 4\frac{3}{4}$
$1\frac{1}{8} \div 2\frac{1}{6}$	$5 \div 2\frac{1}{2}$
$6 \div 2\frac{2}{5}$	$10\frac{3}{4} \div 2\frac{1}{4}$

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FRACTION WORD PROBLEMS REVIEW

Show all work and steps necessary to solve each problem below.

1.) Cassie had $\frac{3}{5}$ liter of salt solution. She used one-tenth liter for an experiment in science class. How many liters of solution did she have left?

2.) At least $\frac{3}{4}$ of the twenty questions on a test must be answered correctly to pass. How many questions must Brad answer correctly to pass the test?

3.) Sandy has 24 yards of ribbon to use for bows. Each bow requires $\frac{3}{4}$ yard of ribbon. How many bows can she make? How much material will be left over?

4.) The length of a rectangular pool is $8\frac{1}{4}$ feet. The area of the pool is$16\frac{1}{2}$ square feet. What is the width of the pool in feet?

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FRACTION WORD PROBLEMS REVIEW

Show all work and steps necessary to solve each problem below.

5.) A recipe for cookie dough calls for $3\frac{2}{3}$ cups of flour. Jane only has $1\frac{3}{4}$ cups of flour. How many more cups of flour does Jane need to make the cookie dough?

6.) Sarah needs to take 32 pictures for a photography class. Three fourths of the pictures must be taken outdoors? How many pictures is that?

7.) Find the area of a rectangular piece of paper that measures $8\frac{1}{2}$ inches by 11 inches.

8.) A board eight feet long is cut into pieces that measure $\frac{3}{5}$ foot long. How many pieces can be cut from the board? How much wood from the board will be left over?

Integers

Integers are all the whole numbers and their opposites. When we work with integers, we are using positive numbers, negative numbers, and zero. We are NOT using any fractions or decimals. …-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5 …

Addition:

When adding two negative integers, add the numbers and attach a negative sign. The answer will be negative. Think of it as owing Matt $10 and owing Kate $15. Together, you owe Matt and Kate $25. (-$10) + (-$15) = (-$25)

Examples: (-22) + (-19) = (-41) Think: 22 + 19 = 41, then put on the negative (-41).

(-5) + (-14) + (-7) = (-26) Think: 5 + 14 + 7 = 26, then attach a negative (-26).

When adding a negative number and a positive number, take the sign of the *larger looking* number and subtract. Or, think of it as subtracting the absolute values of the numbers. Your answer will have the sign of the integer with the greater absolute value.

Examples: (-6) + 10 = 10 – 6 = +4 Positive answer because 10 "looks larger".

(-18) + 7 = 18 – 7 = -11 Negative answer because (-18) "looks larger".

Subtraction:

When subtracting integers, rewrite the expression as adding the opposite of the second number. Then follow the rules for addition of integers. Use the "Keep, Change, Opposite" Rule: Keep the first number exactly as it is, Change the subtraction sign to addition, write the Opposite of the second number, and then solve the new problem.

Examples: 5 – 9 = 5 + (-9) = (-4)

7 – (-8) = 7 + (+8) = 15

(-6) – 7 = (-6) + (-7) = (-13)

(-4) – (-2) = (-4) + (+2) = (-2)

(-3) – (-12) = (-3) + (+12) = +9

Multiplication and Division:

The rules for multiplication of integers are exactly the same as the rules for division of integers.

When you multiply or divide two positive numbers, the answer is positive.

When you multiply or divide two negative numbers, the answer is positive.

When you multiply or divide a positive number and a negative number, the answer is negative.

Always determine the sign of your answer first before you solve the problem!

Examples: $2 \times 9 = 18$ $(-2) \times (-9) = 18$

$(-2) \times 9 = (-18)$ $2 \times (-9) = (-18)$

$15 \div 3 = 5$ $(-15) \div (-3) = 5$

$(-15) \div 3 = (-5)$ $15 \div (-3) = (-5)$

When you have more than two numbers to multiply or divide, count up the number of negative signs in the problem. If you have an even amount of negative signs, your answer will be positive. If you have an odd number of negative signs, your answer will be negative.

Examples: $(-36) \div (-4) \div (-3) = -3$ Three negative signs means a negative answer.

$(-6) \times 4 \times (-2) = +48$ Two negative signs means a positive answer.

$(-100) \times (-3) \div (-50) \times (-7) = +42$ Four negative signs means positive answer.

Absolute Value:

The absolute value of a number is the distance between the number and zero on the number line. The answer to an absolute value problem should always be positive, unless there is an operation outside of the absolute value bars.

Examples: $|-4| = +4$ Negative four is four spaces from zero on the number line.

$|5| = +5$ Positive five is five spaces from zero on the number line.

$|10 - 16| = |-6| = +6$ Negative six is six spaces from zero on the number line.

$|(-12) + 20| - 10 = |+8| - 10 = 8 - 10 = -2$

**This answer is negative because you have to subtract ten from the answer to your absolute value. Your absolute value gives you a positive eight, but then you need to take away ten, which results in a negative two for our answer. **

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INTEGERS REVIEW

ADD:

4 + (-11) =	(-3) + (-3) =	6 + (-9) =
(-8) + 8 =	(-9) + (-4) =	(-12) + 17 =
(-22) + (-14) =	(-29) + 33 =	42 + (-49) =
(-9) + (-7) + 5 =	14 + (-6) + (-2) =	4 + (-7) + 5 =

SUBTRACT:

5 – (-7) =	(-6) – 9 =	(-4) – (-10) =
19 – 24 =	(-36) – (-14) =	(-25) – 41 =
(-7) – (-18) =	23 – (-15) =	(-16) – (-1) =
(-10) – (-3) – 4 =	13 – (-6) – 12 =	(-18) – 11 – (-2) =

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INTEGERS REVIEW

MULTIPLY:

$(-4) \times 6 =$	$(-5) \times (-7) =$	$12 \times (-7) =$
$(-8) \times (-11) =$	$(-13) \times 2 =$	$16 \times (-3) =$
$(-5) \times 14 =$	$(-4) \times (-10) =$	$20 \times (-5) =$
$(-2) \times (-6) \times (-4) =$	$5 \times (-2) \times (-6) =$	$(-2) \times (-3) \times (-4) \times (-5) =$

DIVIDE:

$40 \div (-8) =$	$(-24) \div (-6) =$	$(-72) \div 9 =$
$(-45) \div (-9) =$	$(-56) \div 7 =$	$64 \div (-16) =$
$(-150) \div (-15) =$	$99 \div (-11) =$	$(-51) \div 3 =$
$(-120) \div (-2) \div (-3) =$	$60 \div (-6) \div (-2) =$	$84 \div (-4) \div 3 =$

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INTEGERWORD PROBLEMS REVIEW

Show all work and steps necessary to solve each problem below.

1.) When Allison went to bed, the temperature was –8°C. If the temperature drops ten degrees overnight, what will the temperature be when Allison gets up?

2.) While playing a math game on FASTMATH, Nathan scored the following points: +20, -30, -10, +50, -40, -20 -20, +10. What was Nathan's final score?

3.) Mount McKinley in Alaska is the highest point in North America. Its elevation is 20,320 ft. Death Valley in California is the lowest point with an elevation of -282 ft. What is the difference in these elevations?

4.) In the game of golf, par is worth +0, a birdie is worth -1, an eagle is worth -2, a bogey is worth +1 and a double bogey is worth +2. Mark played eighteen holes of golf with his dad and shot four birdies, seven pars, four bogeys, two double bogeys, and one eagle. What was Mark's score for his round of golf?

5.) Solve the following absolute value problems:

$|5^2 - 32| - 8 =$ $|22 + (-13) - 7| =$