Algebra Readiness
Summer Math Packet

Name _____

Dear Patriots,

It has been a good year, and you have worked hard to master the ideas we covered in Pre-Algebra. I encourage you to take a refreshing break as school ends, and enjoy the things that summer brings your way; read good books, play games, and spend time with family and friends. After July 4th, it is a good idea to begin turning your thoughts toward the upcoming school year. I am sending home a summer math packet to help you prepare to start Algebra strong. It will review math skills you should have mastered, but if you get stumped please go to one of the websites listed on the next page which includes video tutorials and additional practice problems. Or I am happy to help if you need me, simply send me an email.

Show all work. Bring this packet with you on the first day of school for a grade.

Have a great summer!

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The following is a list of websites to visit for additional help or practice material:

- Khan Academy
  - Take control of your learning by working on the skills you choose at your own pace. ... Math, science, computer programming, history, art, economics, and more.
- Algebasics
  - has video tutorials explaining the basics of algebra, equations, ratio and proportion, absolute value, polynomials, factoring, linear equations, radicals, applications, and much more.
- Algebra-Class
  - offers help with solving equations, graphing equations, writing equations, inequalities, functions, exponents and monomials, polynomials, and the quadratic equation. It also has a list of resources.
- Algebra Help
  - contains lessons on topics that include equations, simplifying, factoring, distribution, and trinomials, as well as equation calculators and worksheets. This site also has an extensive list of math resources and study tips. •
- Help Algebra
  - covers topics such as fractions, percents, decimals, algebraic expressions, addition, multiplication, and word problems. Each section includes explanations and examples.
- College Cram
  - allows students to choose the algebra subject they are struggling with from a drop down menu, select the appropriate chapter, and pick your resources. The oages will feature formula solvers, bottomless worksheets, flashcards, quizzes, interactive overviews, and brief lessons and study sheets.
- Interactive Mathematics
  - has a large section on algebra, including information on factoring and fractions, the quadratic equation, exponents and radicals, systems of equations, matrices and determinants, and inequalities.
- Math Expression
  - has videos, worksheets, and lessons to help you develop your algebra skills. Math topics include algebra, exponents, symmetry, fractions, measurements, angles, and more. The site also includes a list of useful resources.
- Purple Math
  - contains lessons with explanations on everything from absolute value and negative numbers to intercepts, variables, and factoring. In addition, this site includes a forum that allows students to ask questions and receive answers, as well as a list of homework tips and guidelines.

I. Integers

Remember

* Integers are all whole numbers (not fractions) that can be positive, negative, or zero. That is, all the numbers {...-4, -3, -2, -1, 0, 1, 2, 3, 4,...}.

Problem Set 1

For each of the following, please give the prime factorization. (Use a factor tree to help).

1. 24 2. 42 3. 48

Problem Set 2

For each of the following, perform the indicated operation.

1. $-6+(-13)$ 2. $19(0)$ 3. $6+(-9)+1$ 4. $5-7$

5. $-7-(-3)$ 6. $6(-4)$ 7. $2(-3)+0(5)$ 8. $21 \div -7$

9. $3(-7)(-2)$ 10. $-4-(-6)$ 11. $-28+16+34$ 12. $-8-15$

Problem Set 3

Read and perform the indicated operations.

1. What is the sum of 8 and 17?
2. What is the difference between 3 and 12?
3. What is the product of -3 and 14?
4. What is the quotient of 15 and -5?
5. If the sum is 4 and one of the integers is 1, what must the other integer be?

Problem Set 4

Evaluate the expression when $x = -7$ and $y = 5$.

1. $8xy$ 2. $27 + 3y^2 + x$

Problem Set 5

Simplify the expression.

1. $-4(11m)$ 2. $(3a)(17)$ 3. $b + (-14) + 35$ 4. $8 + c + (-5)$

5. $d + 7d$ 6. $4m - 6m - 7m$ 7. $6x - (x - 1)$ 8. $-3(r + 2) - 3r$

II. Fractions

Problem Set 6

Identify the two integers that each of the following fractions is between.

1. $\frac{-21}{4}$ 2. $\frac{9}{21}$

Problem Set 7

Perform the indicated operation.

1. $1\frac{2}{7} + \left(-3\frac{4}{7}\right)$ 2. $\left(-3\frac{3}{5}\right) - 4\frac{2}{5}$ 3. $3\frac{6}{7} + \left(-1\frac{1}{7}\right)$ 4. $\left(-1\frac{3}{4}\right) + \left(-3\frac{3}{4}\right)$

Problem Set 8

Perform the indicated operation.

1. $\frac{8}{10} \div \frac{2}{3}$ 2. $\frac{2}{3} \bullet \frac{2}{4}$ 3. $\frac{7}{8} + \left(-\frac{3}{16}\right)$ 4. $\frac{3}{7} \times \frac{5}{18}$

5. $\frac{1}{2} \div \frac{1}{4}$ 6. $\frac{1}{2} + \frac{2}{4}$ 7. $\frac{2}{4} + \frac{6}{10}$ 8. $\frac{3}{10} + \frac{1}{2}$

9. $\frac{9}{10}\left(-\frac{5}{21}\right)$ 10. $-\frac{3}{4} - \frac{2}{7}$ 11. $-\frac{4}{11} + \frac{9}{11}$ 12. $\frac{7}{18} - \frac{17}{18}$

Problem Set 9

Read and solve each question using proportions.

1. A car travels 150 km on 12L of gasoline. How many liters of gasoline are needed to travel 500 km?

2. A baseball pitcher strikes out an average of 3.6 batters per 9 innings. At this rate, how many batters will the pitcher strike out in 315 innings?

3. A watch loses 2 minutes every 15 hours. How much time will it lose in 2 hours?

4. A school has a policy that 2 adults must accompany every group of 15 students on school trips. How many adults are needed to take 180 students on a trip?

III. Linear Equations and Inequalities

Remember:

*To solve equations, you must first get your like terms together, then isolate the variable.

*To solve inequalities, the sign changes direction when multiplying or dividing by a negative integer.

Problem Set 10

Solve each equation.

1. $4x = 2x + 6$

2. $3x = x + 20$

3. $6x + 7 = 5x + 13$

4. $10x - 6 = 7x + 9$

5. $5x - 1 = 2x + 11$

6. $6x - 1 = x + 19$

7. $-3(2x + 5) = 15$

8. $7x - 4(x - 3) = 33$

9. $6(x + 8) = 5x + 4$

Problem Set 11

Solve each inequality. Graph your solution on a number line.

1. $a + 3 < 10$ 2. $19 \geq b - 29$ 3. $-5d > 40$

IV. Monomials/Exponents/Square Roots

Problem Set 12

Find the greatest common factor of the following.

1. $51,\ 63$ 2. $56, 136$

3. $48y^2,\ 52y$ 4. $16p,\ 68p$

Problem Set 13

Find the least common multiple of the following.

1. $10,\ 15$ 2. $18,\ 45$

3. $10n^2,\ 16np$ 4. $4s^3,\ 36s^2$

Problem Set 14

Find the product or quotient. Write your answer using exponents.

1. $6^5 \bullet 6^9$ 2. $4c^3 \bullet 5c^2$ 3. $\frac{6a^6}{a^3}$ 4. $\frac{4^{11}}{4^5}$

5. $12^3 \bullet 12^4 \bullet 12^2$ 6. $\frac{3^8}{3}$ 7. $7d^5 \bullet d^2$ 8. $\frac{15r^7}{12r^4}$

Write the expression using only positive exponents.

9. 18^{-4} 10. 7^{-8} 11. s^3t^0 12. $5w^{-2}$

Problem Set 15

Find the square roots of the number.

1. 49 2. 2500 3. 144 4. 100

Simplify the expression.

5. $\sqrt{54x}$ 6. $\sqrt{30}$ 7. $\frac{\sqrt{32\,a^2}}{\sqrt{81}}$ 8. $\sqrt{75a^2}$

Estimate the square root to the nearest whole integer.

9. $-\sqrt{10}$ 10. $\sqrt{95}$ 11. $\sqrt{65}$ 12. $-\sqrt{50}$

V. Decimals

Problem Set 16

Write the fraction or mixed number as a decimal.

1. $\frac{3}{5}$ 2. $-\frac{14}{9}$ 3. $-\,6\frac{13}{25}$

Write the decimal or fraction as a mixed number.

4. 0.34 5. $-\,3.78$ 6. $0.\overline{5}$

Problem Set 17

Add or subtract.

1. $3.7 + 8.9$ 2. $75.006 + 2.3 + 15.863 + 246.9$ 3. $8.1 + 268 + 49.64$

4. $3.16 - 1.87$ 5. $162.8 - 46.96$ 6. Subtract 1.97 from 15.1

Problem Set 18

Multiply or divide.

1. 5.82×0.78 2. $0.01 \times 0.167 \times 0.9$

3. $0.17 \div 8.5$ 4. $\$13.92 \div 8$

Arrange from smallest to largest.

5. $1.62,\ 1.6,\ 1.06,\ 1.16,\ 1.66$ 6. $0.808,\ 0.81,\ 0.8019,\ 0.807,\ 0.8$

VI. Percents

Remember:

*To find the percent of a number, change the percent to a decimal and multiply.

*The percent proportion is $\frac{is}{of} = \frac{\%}{100}$.

*The percent of change can be found using the proportion $\frac{difference}{original} = \frac{\%}{100}$.

Problem Set 19

Write the decimal as a percent or the percent as a decimal.

1. 0.045 2. 1.34 3. 7% 4. 0.25%

Problem Set 20

Find the percent of the number.

1. $40\%\ of\ 300$ 2. $25\%\ of\ 28$ 3. $75\%\ of\ 76$

Problem Set 21

Use the percent proportion to answer the question.

1. What number is 52% of 625?

2. What percent of 72 is 252?

3. 117 is 45% of what number?

4. What number is 0.5% of 3400?

Problem Set 22

Identify the percent of change as an increase or decrease. Then find the percent of change.

1. Original: 40
   New: 62

2. Original: 92
   New: 23