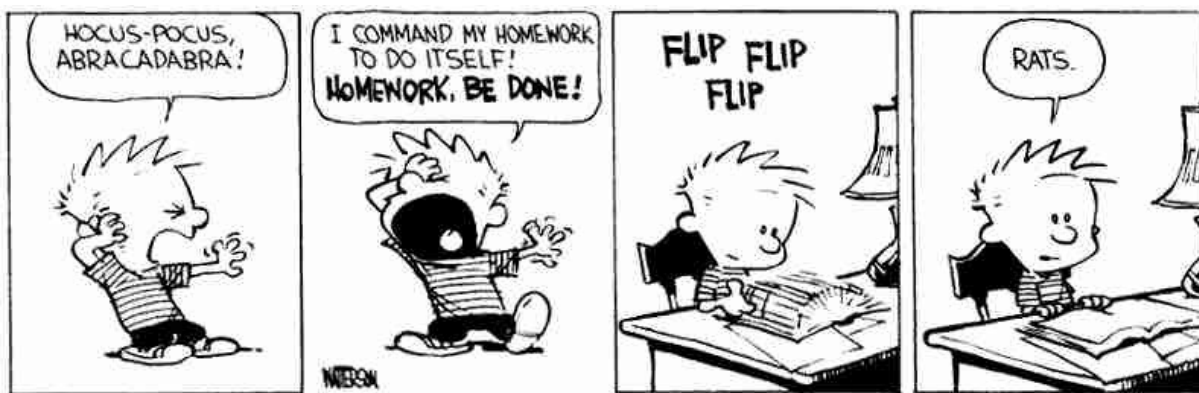


FOR ALL STUDENTS TAKING ALGEBRA I

2013-2014

SUMMER REVIEW PACKET



Dear Student and Parent/Guardian,

The math department at Central Dauphin School District wants you to be successful in Algebra I. We also want you to be prepared for PSSA and Keystone Exams. This summer packet is designed to help you reach these goals by reviewing necessary skills.

Be sure to follow the key information below when completing this packet:

- The packet is due when you return to school in August.
- **Every problem must be completed. None left blank.**
- The packet is worth 10 times a regular homework grade.
- Work must be shown to receive credit – no work, no points.
Show the work on the packet pages. Do NOT add additional pages.
- Final answers must be shown on the answer pages at the back of the packet.
- A possible Quiz covering the material from the packet may be given at the end of the first week of school. These topics also tie in with the first few units of Algebra 1.
- All topics covered in the packet should be completed without the aid of a calculator. If it is decided to give a Quiz on the summer packet topics, no calculator will be allowed on the Quiz.
- When you return in August, you will have the opportunity to ask questions. Math Help will also be available during the first week.

We hope that you have an enjoyable summer and return to school ready to be successful in Algebra I!

Helpful Websites

www.glencoe.com www.regentsprep.org www.khanacademy.org www.purplemath.com/modules
www.Aleks.com (a website where you can subscribe for individual math lessons)

ORDER OF OPERATIONS USING INTEGERS

A Review on Operations on Integers

<p>Addition Problems:</p> <p><i>negative + negative</i> <i>negative + positive</i></p> <p>$-6 + (-20)$ $6 + (-20)$ $-6 + 20$</p> <p style="text-align: center;"> (-26) (-14) (14) </p>	<p style="text-align: center;">Subtraction Problems:</p> <p>Subtraction is the same as adding the opposite. (of the 2nd number)</p> <p>$18 - 32 \rightarrow 18 + (-32)$</p> <p style="text-align: center;">(-14)</p> <p>$-25 - 11 \rightarrow -25 + (-11)$ $-4 - (-13) \rightarrow -4 + +13$</p> <p style="text-align: center;"> (-36) (9) </p>
<p>Multiplication & Division Problems:</p> <p><i>negative & positive</i> <i>negative & negative</i></p> <p>$-18 \cdot 2$ $-18 \div 2$ $-15 \cdot (-3)$ $-15 \div (-3)$</p> <p style="text-align: center;"> (-36) (-9) (45) (5) </p>	<p style="text-align: center;">Remember PEMDAS</p> <p>$-7 + (-18 \div 2)^2 \div 3 \cdot 5$</p> <p style="margin-left: 20px;">$-7 + (-9)^2 \div 3 \cdot 5$</p> <p style="margin-left: 20px;">$-7 + 81 \div 3 \cdot 5$</p> <p style="margin-left: 20px;">$-7 + 27 \cdot 5$</p> <p style="margin-left: 20px;">$-7 + 135$</p> <p style="text-align: center;">(128)</p> <p style="margin-left: 20px;"> parentheses exponents multiplication/division (left to right) addition/subtraction (left to right) </p>

Find the value of the expression.

1. $15 - 12 \div 4$

2. $7 + 2 \cdot 4 - 4$

3. $23 - (-17 + 8)$

4. $24 \div (-3) \cdot 2 - 3^2$

5. $-12(20 - 17) - 3 \cdot 6$

6. $3[2 + (12 \div 3)^2]$

7. $\frac{-8(2) - 4}{8 \div 4}$

8. $(4 - 10)^2 - [(-10) \div (-5)]$

9. $\frac{2 \cdot 4^2 - 8 \div 2}{(5 + 2) \cdot 2}$

10. Let $x = -2$, $y = 4$, and $z = \frac{1}{2}$
Evaluate $z(y - 3x) + x$

OPERATIONS ON FRACTIONS & MIXED NUMBERS

Addition & Subtraction Problems:

You must have common denominators before adding or subtracting.
Making them improper fractions first is optional (your choice).

$$9\frac{1}{18} + 4\frac{5}{6}$$

$$9\frac{1}{18} + 4\frac{5 \cdot 3}{6 \cdot 3}$$

$$9\frac{1}{18} + 4\frac{15}{18}$$

$$13\frac{16 \div 2}{18 \div 2}$$

$$\boxed{13\frac{8}{9}}$$

$$4\frac{3}{4} - 1\frac{5}{6}$$

$$4\frac{3 \cdot 3}{4 \cdot 3} - 1\frac{5 \cdot 2}{6 \cdot 2}$$

$$4\frac{9}{12} - 1\frac{10}{12}$$

$$\boxed{2\frac{11}{12}}$$

side work

$$\begin{array}{r} 21 \\ 3 \cancel{9} \\ \underline{12} \\ - 1\frac{10}{12} \\ \hline 2\frac{11}{12} \end{array}$$

or make them improper fractions

$$4\frac{9}{12} - 1\frac{10}{12}$$

$$\frac{57}{12} - \frac{22}{12}$$

$$\frac{35}{12} \text{ or } \boxed{2\frac{11}{12}}$$

Multiplication & Division Problems:

You must make mixed numbers become improper fractions before multiplying or dividing.
There's no need to get common denominators.

$2\frac{2}{3} \cdot 1\frac{1}{6}$ or you can reduce any numerator with any denominator before multiplying

$$\frac{8}{3} \cdot \frac{7}{6}$$

$$\frac{8 \div 2}{3} \cdot \frac{7}{6 \div 2}$$

$$\frac{56 \div 2}{18 \div 2}$$

$$\frac{4}{3} \cdot \frac{7}{3}$$

$$\frac{28}{9} \text{ or } \boxed{3\frac{1}{9}}$$

$$\frac{28}{9} \text{ or } \boxed{3\frac{1}{9}}$$

Division = Multiplying by the Reciprocal
(of the 2nd number)

$$\frac{4}{7} \div 1\frac{2}{9}$$

$$15 \div 2\frac{1}{2}$$

$$\frac{4}{7} \div \frac{11}{9}$$

$$\frac{15}{1} \div \frac{5}{2}$$

$$\frac{4}{7} \cdot \frac{9}{11}$$

$$\frac{15}{1} \cdot \frac{2}{5}$$

$$\boxed{\frac{36}{77}}$$

$$\frac{15 \div 5}{1} \cdot \frac{2}{5 \div 5}$$

$$\frac{3}{1} \cdot \frac{2}{1}$$

$$\frac{6}{1} \text{ or } \boxed{6}$$

Find the value of each expression. Final answers must be in simplest form (including improper fractions to mixed numbers).

1. $\frac{2}{3} + \frac{9}{3}$

2. $\frac{1}{4} + \frac{1}{5}$

$$3. \frac{13}{20} - \frac{2}{5}$$

$$4. \frac{5}{6} - 3\frac{1}{2}$$

$$5. 3\frac{3}{4} + 2\frac{1}{6}$$

$$6. \frac{7}{2} \cdot \frac{3}{2}$$

$$7. 2\frac{1}{4} \cdot \frac{1}{18}$$

$$8. \frac{3}{2} \div \frac{1}{8}$$

$$9. \frac{3}{7} \div \frac{1}{5}$$

$$10. \frac{2}{3} \div 1\frac{1}{3}$$

VERBAL EXPRESSIONS

ADDITION	SUBTRACTION	MULTIPLICATION	DIVISION	EXPONENTS
Plus	Minus	Multiplied by	Divided by	Square of (2^{nd} power)
Increased by	Decreased by	Times	Quotient of	Cube of (3^{rd} power)
More than	Fewer than	Product	Into	Power of
Sum of	Less	Twice, One-half, etc.		
	Less than	Of (<i>usually with fractions</i>)		
	Difference of			

Write an algebraic expression for each verbal expression.

- The sum of two-fifths a number and eight: $\frac{2}{5}n + 8$
- Seven more than twice the difference a number and five: $7 + 2(n - 5)$ or $2(n - 5) + 7$

1. The sum of 9 and a number
2. The difference of a number cubed and twelve
3. A number decreased by 8
4. Three less than 5 times a number
5. One-third the square of b
6. The product of four and x increased by y
7. The quotient of a number and negative 5
8. A number to the power of five less seven
9. Twice the sum of 15 and a number
10. The quotient of three and the sum of a number and 11

SOLVING EQUATIONS USING INVERSE OPERATIONS

Examples on Solving Equations Using Inverse Operations:

1.) $x + 72 = 14$

$$\begin{array}{r} -72 \quad -72 \\ \hline x = -58 \end{array}$$

$$\begin{array}{r} 6 \quad 12 \\ \times \lambda \\ \hline -14 \\ 58 \end{array}$$

2.) $-39 = r - 50$

$$\begin{array}{r} +50 \quad +50 \\ \hline 11 = r \end{array}$$

3.) $-8w = -168$

$$\begin{array}{r} \div (-8) \quad \div (-8) \\ \hline w = 21 \end{array}$$

4.) $\frac{h}{15} = -5$

$$\begin{array}{r} \cdot 15 \quad \cdot 15 \\ \hline h = -75 \end{array}$$

5.) $-21h + 9 = -75$

$$\begin{array}{r} -9 \quad -9 \\ \hline -21h = -84 \end{array}$$

think:
 $-75 + (-9)$

$$\begin{array}{r} \div (-21) \quad \div (-21) \\ \hline h = 4 \end{array}$$

6.) $-34 + \frac{n}{-3} = 2$

$$\begin{array}{r} +34 \quad +34 \\ \hline \frac{n}{-3} = 36 \end{array}$$

S

A

D

M

E

P

$$\begin{array}{r} \cdot (-3) \quad \cdot (-3) \\ \hline n = -108 \end{array}$$

When using inverse operations, go in the "inverse order" of PEMDAS. (SADMEP)

Solve each equation using inverse operations. Final answers must be in simplest form (including improper fractions to mixed numbers). No decimals.

1. $x - 6 = -23$

2. $x - (-8) = 22$

3. $-4x = 14$

4. $\frac{x}{7} = -8$

5. $\frac{2}{3}x = 10$

6. $17 = -5 + x$

7. $4x + 11 = 27$

8. $-2 - 9x = 34$

9. $13 - x = -8$

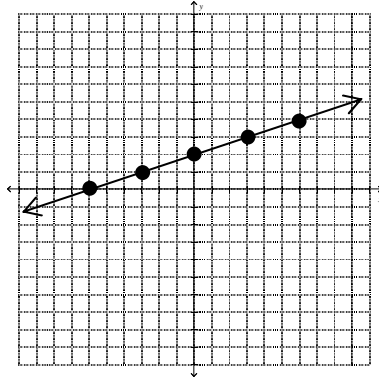
10. $\frac{3}{5}x + 2 = 7$

GRAPHING POINTS ON A COORDINATE PLANE

For each equation, use the given x -coordinates to complete the table. Then, graph the line.

Example: $y = \frac{1}{3}x + 2$

x	y
-6	0
-3	1
0	2
3	3
6	4



sample work:

$$\begin{array}{lll}
 y = \frac{1}{3}x + 2 & y = \frac{1}{3}x + 2 & y = \frac{1}{3}x + 2 \\
 y = \frac{1}{3} \cdot 0 + 2 & y = \frac{1}{3}(-6) + 2 & y = \frac{1}{3} \cdot 3 + 2 \\
 y = 0 + 2 & y = -2 + 2 & y = 1 + 2 \\
 y = 2 & y = 0 & y = 3
 \end{array}$$

For each equation, use the given x -coordinates to complete the table. Show your work in the spaces provided. Then, graph the ordered pairs and line on the coordinate plane provided on the answer page.

1. $y = 3x - 1$

x	y
-2	
-1	
0	
1	
2	

2. $y = -x + 2$

x	y
-6	
-5	
-1	
4	
7	

3. $y = -2x - 7$

x	y
-7	
-5	
-2	
0	
1	

4. $y = \frac{1}{2}x + 3$

x	y
-4	
-2	
0	
2	
4	

5. $y = \frac{2}{3}x + 4$

x	y
-6	
-3	
0	
3	
6	

ANSWER PAGES

ORDER OF OPERATIONS USING INTEGERS

- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

OPERATIONS ON FRACTIONS AND MIXED NUMBERS

- _____
- _____
- _____
- _____
- _____
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VERBAL EXPRESSIONS

- _____
- _____
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- _____

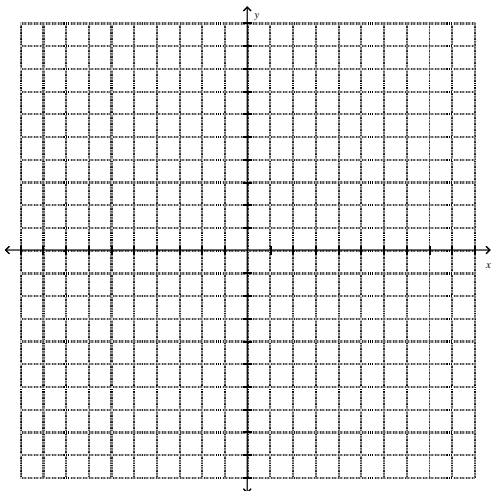
SOLVING EQUATIONS USING INVERSE OPERATIONS

- _____
- _____
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- _____

GRAPHING POINTS ON A COORDINATE PLANE

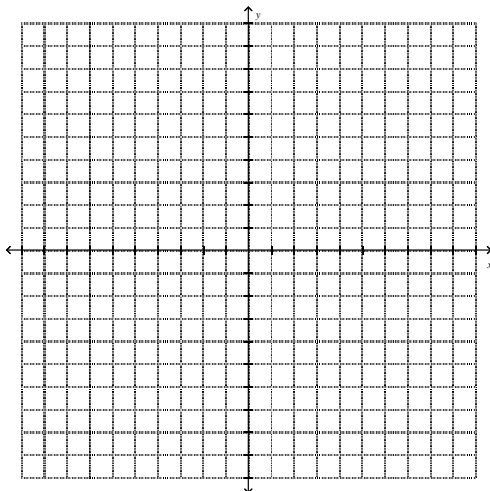
1.

x	y
-2	
-1	
0	
1	
2	



2.

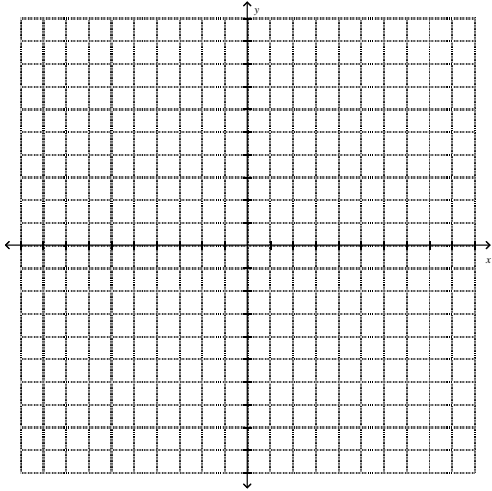
x	y
-6	
-5	
-1	
4	
7	



Continue →

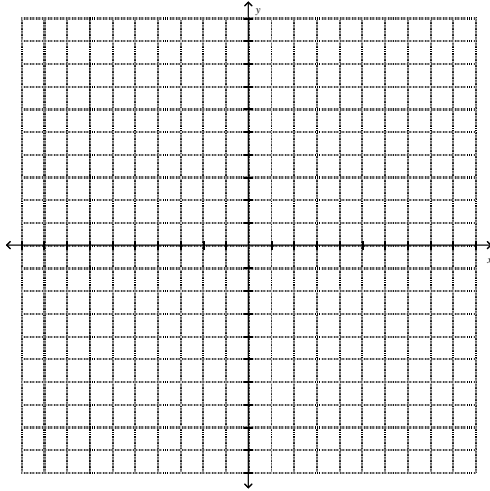
3.

x	y
-7	
-5	
-2	
0	
1	



4.

x	y
-4	
-2	
0	
2	
4	



5.

x	y
-6	
-3	
0	
3	
6	

