

# POSNACK

S C H O O L

## Algebra 1 Honors Summer Assignment

Dear Parents/Students,

In the summertime, many necessary mathematical skills are lost due to the absence of daily exposure. The loss of skills may result in a lack of success and unnecessary frustration for students as they begin the new school year. The purpose of this math assignment is to set the stage for instruction for the new school year. Packets can be printed out or can be printed to OneNote. The completed packet is due on the first day of school during math class and will be worth 30 homework points. The packet is a review of previously taught concepts. If needed, additional help can be found at [www.khanacademy.org](http://www.khanacademy.org). These skills are required to be successful in the upcoming year. We will review this information during the first week of school, and then there will be a Summative Assessment given on the material.

Thank you,

Fischer High School Math Team

Rules: \*\* If a number has no sign it means it is a positive number. \*\*

Addition

SAME SIGNS

- 1) Add their absolute values.
- 2) Attach the common signs.

$$-4 + (-5) = -(4 + 5) = -9 \qquad 4 + 5 = 9$$

OPPOSITE SIGNS

- 1) Subtract the smaller absolute value from the larger absolute value.
- 2) Attach the sign of the number with the larger absolute value.

$$3 + (-9) = -(9 - 3) = -6 \qquad -3 + 9 = +(9 - 3) = 6$$

Subtraction

- 1) Adding the opposite of a number is equivalent to subtracting the number.
- 2) Change all problems to addition and follow the addition rules.

$$3 - 12 = 3 + (-12) = -(12 - 3) = -9$$

$$-7 - 1 = -7 + (-1) = -(7 + 1) = -8$$

$$-4 - (-10) = -4 + 10 = +(10 - 4) = 6$$

$$12 - (-8) = 12 + 8 = 20$$

**NO CALCULATOR!**

1. $7 + (-9) =$	2. $-12 + 15 =$
3. $2 - 4 =$	4. $12 - 19 =$
5. $-7 - (-5) =$	6. $7 + 27 =$
7. $-12 - (-4) =$	8. $0 - 8 =$
9. $0 - (-6) =$	10. $-8 - 2 =$
11. $-3 + 1 =$	12. $-7 + (-5) =$
13. $-9 - (-13) + (-4) =$	14. $-6 - 4 - (-8) =$
15. $25 - 21 + (-20) =$	16. $-39 - (-32) - 14 =$

Rules:

- 1) If two numbers have the same sign, their product or quotient is positive.

$$(-7)(-5) = 35 \qquad 6 \cdot 8 = 48$$

- 2) If two numbers have opposite signs, their product or quotient is negative

$$9(-2) = -18 \qquad (-3)(4) = -12$$

**NO CALCULATOR!**

1. $(-8)(3) =$	2. $(4)(-4) =$
3. $(20)(-65) =$	4. $-7 \cdot -5 =$
5. $-45 \div 9 =$	6. $\frac{-24}{-4} =$
7. $49 \div (-7) =$	8. $\frac{-99}{9} =$
9. $(5)(-2)(7) =$	10. $(-3)(-1)(4)(-6) =$
11. $-3740 \div (-10) =$	12. $\frac{56}{-7} =$
13. $(11)(-1)(-7)(-3) =$	14. $\frac{39}{13} =$
15. $(-72) \div (-12) =$	16. $(-9)(8)(-2)(5) =$

Rules:

- 1) Line up decimal points, if a number does not have a decimal point it is a whole number with the decimal point at the end.
- 2) Annex zeros to hold place.
- 3) Add or subtract vertically.
- 4) Bring down the decimal point.

$$4.1 + 3 + 5.61 + 21$$

$$16 - 7.498$$

$$4.10$$

$$16.000$$

$$3.00$$

$$\underline{- 7.498}$$

$$5.61$$

$$8.502$$

**NO CALCULATOR!**

1. $5.1 + 2.23 + 8$	2. $9 + 3.3 + 0.781$
3. $6.7 - 3.987$	4. $5.21 + 6.5 + 8.123$
5. $9.8 - 2.0871$	6. $7.3 + 4.3 + 12 + 0.543$
7. $9.1 + 7.89 - 2.6$	8. $16 - 7.5 + 3.12$
9. $2.8 + 15 - 9.12$	10. $7.8 - 2.3 + 15$
11. $8 + 4.1 - 0.123$	12. $6.3 - 0.45 + 2.45$

Rules:

Multiplying

- 1) Line up digits, starting on the right.
- 2) Multiply
- 3) Place the decimal point in the answer by starting at the right and moving a number of places equal to the sum of the decimal places in both numbers multiplied.

$$\begin{array}{r}
 (6.432)(4.15) \\
 6.432 \text{ (3 decimal places)} \\
 \times 4.15 \text{ (2 decimal places)} \\
 \hline
 32160 \\
 64320 \\
 \hline
 2572800 \\
 26.69280 \text{ (5 decimal places)}
 \end{array}$$

Dividing

- 1) If the divisor is not a whole number, move the decimal point To the right to make it a whole number and move the decimal Point in the dividend the same number of places.
- 2) Divide.
- 3) Bring the decimal point up.

$$\begin{array}{r}
 27.216 \div 4.8 \\
 \hline
 5.67 \\
 48.)272.16 \\
 \underline{-240} \phantom{00} \\
 321 \phantom{00} \\
 \underline{-288} \phantom{00} \\
 336 \\
 \underline{-336} \\
 0
 \end{array}$$

**NO CALCULATOR!**

1. $5.4(0.5)$	2. $5.9(0.07)$	3. $0.68 \cdot 0.14$	4. $4.29 \cdot 0.4$
5. $69.3(0.7)$	6. $9.01(0.15)$	7. $36 \cdot 3.3$	8. $36.8 \cdot 0.55$
9. $0.24 \div 0.8$	10. $84.48 \div 0.88$	11. $\frac{8.3638}{1.9}$	12. $\frac{487.2}{0.56}$
13. $34.06 \div 0.13$	14. $147 \div 0.49$	15. $\frac{9.447}{6.7}$	16. $\frac{167.4}{0.093}$

Rules:

- |                                    |   |                                    |
|------------------------------------|---|------------------------------------|
| 1) Find LCD.                       | $3\frac{1}{9} = 3\frac{2}{18} = 2\frac{20}{18}$     | $4\frac{3}{4} = 4\frac{9}{12}$     |
| 2) Change to equivalent fractions. | $-1\frac{5}{6} = -1\frac{15}{18} = -1\frac{15}{18}$ | $+ 5\frac{5}{6} = +5\frac{10}{12}$ |
| 3) Rename, if needed.              |   |                                    |
| 4) Add or Subtract.                | $1\frac{5}{18}$                                     | $9\frac{19}{12} = 10\frac{7}{12}$  |
| 5) Simplify                        |   |                                    |

**NO CALCULATOR!**

1. $2\frac{3}{4} + 5\frac{5}{6}$	2. $9 - 4\frac{2}{5}$	3. $6\frac{1}{3} + 4\frac{3}{5}$	4. $8\frac{1}{9} - 2\frac{5}{6}$
5. $9 + 1\frac{1}{7}$	6. $6\frac{1}{2} + 2\frac{2}{3}$	7. $5\frac{1}{2} + 1\frac{3}{5}$	8. $1\frac{3}{4} - \frac{1}{2}$
9. $\frac{1}{5} + 1\frac{3}{4}$	10. $\frac{4}{5} - \frac{2}{3}$	11. $\frac{5}{7} + 1\frac{4}{5}$	12. $3\frac{5}{8} - 2\frac{1}{6}$

Rules:

- 1) Change all mixed numbers to improper fractions.
- 2) Multiplying across.
- 3) Simplify

$$2\frac{2}{3} \cdot 4\frac{1}{10} = \frac{8}{3} \cdot \frac{41}{10} = \frac{4}{3} \cdot \frac{41}{5} = \frac{164}{15} = 10\frac{14}{15}$$

- 1) Change all mixed numbers to improper fractions.
- 2) Take the reciprocal.
- 3) Multiply across.
- 4) Simplify

$$2\frac{3}{4} \div 3\frac{1}{2} = \frac{11}{4} \div \frac{7}{2} = \frac{11}{4} \cdot \frac{2}{7} = \frac{11}{2} \cdot \frac{1}{7} = \frac{11}{14}$$

**NO CALCULATOR!**

1. $2\frac{3}{4} \cdot 1\frac{5}{11}$	2. $9 \cdot 4\frac{2}{3}$	3. $1\frac{1}{3} \cdot 4\frac{1}{6}$	4. $1\frac{1}{9} \cdot 2\frac{2}{5}$
5. $9 \cdot 1\frac{1}{3}$	6. $6\frac{1}{2} \cdot 2\frac{1}{13}$	7. $5\frac{1}{2} \div 1\frac{3}{4}$	8. $1\frac{3}{4} \div \frac{1}{2}$
9. $\frac{1}{5} \div 1\frac{3}{4}$	10. $\frac{4}{5} \div \frac{2}{3}$	11. $\frac{9}{20} \div 1\frac{4}{5}$	12. $3\frac{2}{8} \div 2\frac{1}{6}$

Use rules of integers, decimals and fractions.

Examples:

$$-4.1 - (-2.51) = -4.1 + 2.51$$

<i>opposite</i>	-4.10
<i>signs</i>	<u>+2.51</u>
<i>subtract</i>	-1.59

$$-1\frac{3}{4} + \left(-2\frac{5}{6}\right) = -\frac{7}{4} + \left(-\frac{17}{6}\right) = -\frac{21}{12} + \left(-\frac{34}{12}\right) = -\frac{45}{12} = -\frac{15}{4} = -3\frac{3}{4}$$

**NO CALCULATOR!**

1. $3.98 - 6$	2. $5.8 + (-2.5)$	3. $1.8 - (-3.7)$	4. $7 + (-2.8)$
5. $(-0.8) + (-7.2) - 5.4$	6. $1.7 - (-0.8) + 4.013$	7. $-1\frac{1}{2} + 1\frac{3}{5}$	8. $-1\frac{3}{4} - \left(-\frac{1}{2}\right)$
9. $-\frac{1}{5} + 1\frac{3}{4}$	10. $\frac{2}{5} - \frac{4}{5}$	11. $\frac{5}{7} + \left(-1\frac{4}{5}\right)$	12. $-1\frac{5}{8} - 2\frac{1}{6}$

Use rules of integers, decimals and fractions.

Examples:

$$-4.12(-5.3)$$

$$\begin{array}{r} -4.12 \\ \times -5.3 \\ \hline 1236 \\ 20600 \\ \hline +21836 \end{array}$$

$$51 \div (-0.25)$$

$$\begin{array}{r} -205 \\ 025 \overline{)5100.} \\ \underline{50} \\ 100 \\ \underline{100} \end{array}$$

$$-2\frac{2}{3} \cdot 4\frac{1}{10} = -\frac{8}{3} \cdot \frac{41}{10} = -\frac{4}{3} \cdot \frac{41}{5} = -\frac{164}{15} = -10\frac{14}{15}$$

$$-2\frac{3}{4} \div -3\frac{1}{2} = -\frac{11}{4} \div -\frac{7}{2} = -\frac{11}{4} \cdot -\frac{2}{7} = \frac{11}{2} \cdot \frac{1}{7} = \frac{11}{14}$$

**NO CALCULATOR!**

1. $-5.5 \times -4.87$	2. $1.5(-7.1)$	3. $1.7(-3.1)$	4. $-7.8 \times -5.1$
5. $4.2 \div (-2.1)$	6. $-2 \div (-0.5)$	7. $\frac{-6.4}{0.04}$	8. $\frac{6.6}{-1.1}$
9. $-\frac{1}{5} \cdot 1\frac{3}{4}$	10. $\frac{2}{5} \cdot 1\frac{1}{4}$	11. $\frac{5}{7} \cdot (-1\frac{4}{5})$	12. $(-1\frac{5}{8})(-3\frac{1}{5})$
13. $-\frac{3}{2} \div -\frac{10}{7}$	14. $-2 \div -3\frac{4}{5}$	15. $\frac{1}{9} \div -1\frac{1}{3}$	16. $-3\frac{7}{10} \div 2\frac{1}{4}$

Parentheses (Grouping Symbols)	$[(7 - 4)^2 + 3] + 15$	$\frac{(9-7)^2 + 6}{11-6}$
Exponents	$= [3^2 + 3] + 15$	$= \frac{2^2 + 6}{5}$
Multiply or Divide, from left to right	$= [9 + 3] + 15$	$= \frac{4+6}{5}$
Add or Subtract, from left to right	$= 12 + 15$	$= \frac{10}{2}$
		$= 5$

**NO CALCULATOR!**

1. $6 \div 3 + 2 \cdot 7$	2. $5 + 8 \cdot 2 - 4$	3. $16 \div 8 \cdot 2^2$	4. $10 \div (3 + 2) + 9$
5. $7[(18 - 6) - 6]$	6. $3(2.7 \div 0.9) - 5$	7. $6(5 - 3)^2 + 3$	8. $[10 + (5^2 \cdot 2)] \div 6$
9. $\frac{1}{3}(9 \cdot 3) + 18$	10. $\frac{1}{2} \cdot 26 - 3^2$	11. $2.5 \cdot 0.5^2 \div 5$	12. $\frac{16}{8} + 2^3 - 10$
13. $\frac{9 \cdot 2}{4 + 3^2 - 1}$	14. $\frac{13 - 4}{18 - 4^2 + 1}$	15. $\frac{5^3 \cdot 2}{1 + 6^2 - 8}$	16. $\frac{7 \cdot 4}{8 + 7^2 - 1}$

Write the verbal phrase as an algebraic expression.

Eleven less than the quantity four times a number  $x$        $4(x - 11)$

Evaluate the expression

$x^2 + 4 - x$ , when  $x = 6$        $6^2 + 4 - 6$   
 $= 36 + 4 - 6$   
 $= 40 - 6$   
 $= 34$

Write the verbal phrase as an algebraic expression.

1. four times a number $x$ decreased by twelve	2. six less than double a number $x$
3. five squared minus a number $x$	4. three more than the product of five and number $x$
5. twenty-nine decreased by triple a number $x$	6. two cubed divided by a number $x$
7. the quotient of a number $x$ and two-tenths	8. the difference of ten and a number $x$

**NO CALCULATOR!**

Evaluate the expression

9. $y \div 3 + 2$ , when $y = 30$	10. $\frac{r}{s} \cdot 7$ , when $r = 30$ and $s = 5$
11. $5x^2 - y$ , when $x = 4$ and $y = 26$	12. $3r^2 - 17$ , when $r = 6$
13. $\frac{4}{5} \div n + 13$ , when $n = \frac{1}{5}$	14. $\frac{9}{10} \cdot y - \frac{3}{10}$ , when $y = \frac{1}{2}$

# Absolute Value

The absolute value of a real number is the distance between the origin and point representing the number.

If  $a$  is a positive number, then  $|a| = a$

If  $a$  is 0, then  $|a| = 0$

If  $a$  is a negative number, then  $|-a| = a$

$$|12| = 12$$

$$|0| = 0$$

$$|-12| = 12$$

$$|x| = 7, \text{ then } x = 7 \text{ and } -7$$

$$|x| = -5, \text{ then there is no solution}$$

1. $ 17 $	2. $ -4 $	3. $ -4.5 $	4. $\left \frac{2}{3}\right $
5. $\left -\frac{4}{5}\right $	6. $ 0  + 2$	7. $ 6.3  - 3.1$	8. $-\left -\frac{8}{9}\right $
9. $ -6.1  - 6.01$	10. $ -6.4  - 3.1$	11. $x =  -9 $	12. $ x  = -11$
13. $ x  = 4$	14. $ x  = 5$	15. $x =  -3.8 $	16. $ -x  = 1$

## Distributive Property

$$a(c) = ab + bc$$

$$(b + c)a = ba + ca$$

$$a(b - c) = ab - ac$$

$$(b - c)a = ba - ca$$

$$3(2x + 1) = 6x + 3$$

$$(4x + 5)x = 4x^2 + 5x$$

$$-9(x - 8) = -9x + 72$$

$$(x^2 - 3)x = x^3 - 3x$$

## Distribute

1. $3(x + 4)$	2. $(w + 6)4$	3. $5(y - 2)$	4. $(7 - m)8$
5. $-(y - 9)$	6. $(-2)(x + 6)$	7. $(2x - 4)(-3)$	8. $x(x + 1)$
9. $-9(a + 6)$	10. $4x(x + 8)$	11. $-2t(12 - t)$	12. $(3y - 2)5y$
13. $-2x(x - 8)$	14. $-9(-t - 3)$	15. $(6 - 3w)(-w^2)$	16. $-y(-y^2 + y)$

Simplify each expression.

1)  $6n + 5n$

2)  $25b + 15b$

3)  $37z - 4z$

4)  $x - 5x$

5)  $3n + 1 - 2n + 8$

6)  $4f + 5f - 6 + 8$

7)  $2m + 3n - 15m + 4n$

8)  $a + 5b - 2a + 9b$

9)  $-8(x + 5) - 3x + 15$

10)  $-6(4x - 3) - 4(x + 3)$

Solve each equation.

1)  $x + 3 = -5$

2)  $w - 4 = -10$

3)  $-8m = 64$

4)  $\frac{m}{3} = 11$

5)  $\frac{4}{5}d = 12$

6)  $2x - 5 = 11$

7)  $-2m + 16 = -20$

8)  $\frac{f}{3} + 10 = 15$

9)  $\frac{b+4}{2} = 5$

10)  $\frac{5}{2} = \frac{x+4}{8}$

Solve.

<p>1) A video store charges a one-time membership fee of \$12 plus \$1.50 per video rental. How many videos can Sydney rent if she spends \$21?</p>	<p>2) Rachel went to the mall and spent \$41. He bought several t-shirts that each cost \$12 and she bought 1 pair of socks for \$5. How many t-shirts did Rachel buy?</p>
<p>3) Janet weighs 20 pounds more than Anna. If the sum of their weights is 250 pounds, how much does each girl weigh?</p>	<p>4) Three-fourths of the student body attended the pep rally. If there were 1230 at the pep rally, how many students are there in all?</p>
<p>5) Alicia paid \$1.32 for a bag of pinto beans. The beans cost \$0.55 per pound. How much did the bag of pinto beans weigh?</p>	<p>6) How many pieces of <math>10\frac{5}{6}</math> inch bar can be cut from a stock 20 foot bar?</p>
<p>7) Boll's Electrical has a washing machine on sale for <math>\frac{1}{3}</math> off the regular price of \$429. What is the sale price of the washing machine?</p>	<p>8) Ling's hallway is 10 feet long and 4 feet wide. He paid \$200 to tile his hallway floor. How much did Ling pay per square foot for the tile?</p>