

THE SEVEN HILLS SCHOOL

Summer Math Packet for Rising 8th Grade Students entering Geometry 8

Directions:

1. Study “math facts”...addition, subtraction, multiplication, and division of whole numbers 0-12.
2. Complete this math packet *without* the use of a calculator. Check answers with the key provided.
3. Turn this packet in on the first day of school.
4. Enjoy your summer! We are looking forward to seeing you at the start of the new year.

WEEK 1

1. Find the product: $\frac{15}{4} \cdot \frac{8}{25}$	2. Write in lowest terms: $\frac{63}{99}$	3. Find the sum: $\frac{5}{8} + \frac{11}{12} + \frac{7}{15}$
4. Find the quotient: $\frac{24}{7} \div \frac{6}{21}$	5. <i>True or false:</i> $4[-20 + 7(-2)] \leq 135$	6. Write in symbols: The quotient of -6 and the sum of 2 and -8. Simplify the expression.
7. Simplify: $-2 - (5 - 17) + (-6)$	8. Simplify: $-5\frac{1}{2} + 2\frac{2}{3}$	9. Simplify: $-6 - [-7 + (2 - 3)]$
10. I need $2\frac{1}{4}$ yd of fabric to cover a chair. How many chairs can I cover with $23\frac{2}{3}$ yd of fabric?	11. Circle the answer for the best estimate of the sum: $\frac{14}{26} + \frac{98}{99} + \frac{100}{51} + \frac{90}{31} + \frac{13}{27}$ A. 6 B. 7 C. 5 D. 8	12. Evaluate: $4^2 + (-8) - (2^3 - 6)$
13. Evaluate for $x = -2$ and $y = 4$: $3x - 4y^2$	14. Evaluate for $x = -2$ and $y = 4$: $\frac{5x + 7y}{3(x + y)}$	15. Evaluate: $\frac{2(8^2 - 4) + 8}{29 - 3^3}$

WEEK 2

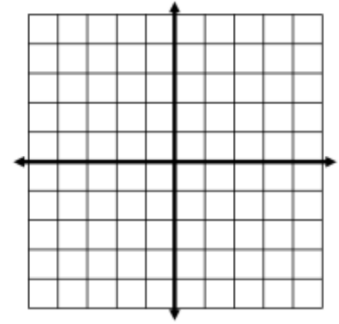
<p>1. Solve: $5x + 9 = 7x + 21$</p>	<p>2. Solve: $-\frac{4}{7}x = -12$</p>	<p>3. Solve: $7 - (x - 4) = -3x + 2(x + 1)$</p>
<p>4. Solve: $0.6(x + 20) + 0.8(x - 10) = 46$</p>	<p>5. Solve: $-8(2x + 4) = -4(4x + 8)$</p>	<p>6. The formula for perimeter of a rectangle is $P = 2L + 2W$. If $P = 116$ and $L = 40$, find the value of W.</p>
<p>7. Solve: $\frac{z}{8} = \frac{12}{16}$</p>	<p>8. Solve: $\frac{x+5}{3} = \frac{x-3}{4}$</p>	<p>9. The distance between Milwaukee and Boston is 1050 mi. On a certain map, this distance is represented by 42 in. On the same map, Seattle and Cincinnati are 92 in. apart. What is the actual distance between Seattle and Cincinnati?</p>
<p>10. Maria invested some money at 3% simple interest and \$6000 more than that amount at 4.5% simple interest. After 1 year, her total interest from the two accounts was \$870. How much did she invest at each rate?</p>	<p>11. Two cars leave from the same point, traveling in opposite directions. One travels at a constant rate of 50 mph, while the other travels at a constant rate of 65 mph. How long will it take for them to be 460 mi apart?</p>	<p>12. Solve. Write the solution set in interval notation. $-4x + 2(x - 3) \geq 4x - (3 + 5x) - 7$</p>
<p>13. Solve. Write the solution set in interval notation. $-10 < 3x - 4 \leq 14$</p>	<p>14. Write a short explanation of the extra rule that must be remembered when solving an inequality (as opposed to solving an equation).</p>	<p>15. Phil has grades of 76 and 81 on his first two algebra tests. If he wants an average of 80 after his third test, what score must he make on that test?</p>

WEEK 3

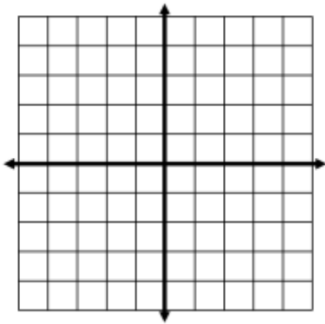
1. Complete the ordered pairs $(0, \underline{\quad})$, $(\underline{\quad}, 0)$, $(\underline{\quad}, -3)$ for the equation $3x + 5y = -30$.

2. Is $(4, -1)$ a solution of $4x - 7y = 9$?

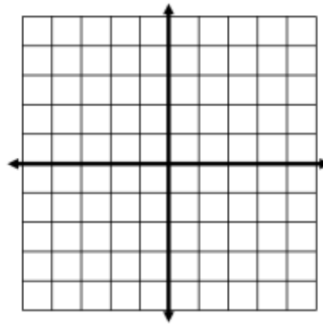
3. Graph $3x + y = 6$. State the x - and y -intercepts.



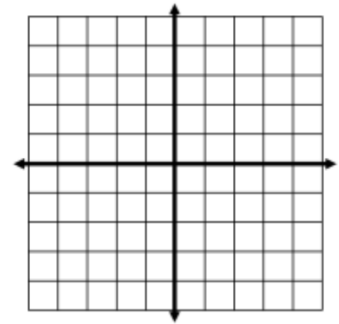
4. Graph $y - 2x = 0$. State the x - and y -intercepts.



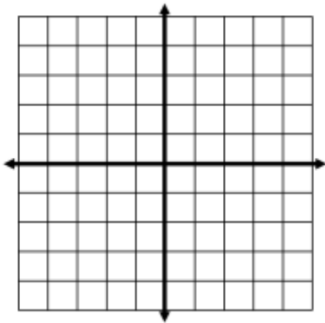
5. Graph $x + 3 = 0$. State the x - and y -intercepts.



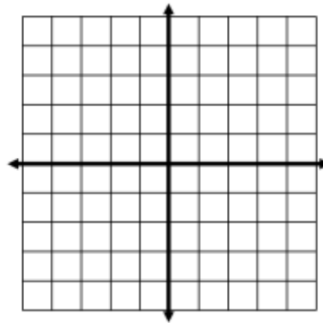
6. Graph $y = 1$. State the x - and y -intercepts.



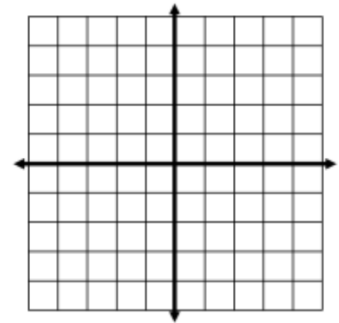
7. Graph $x - y = 4$. State the x - and y -intercepts.



8. Graph the linear inequality. $x + y \leq 3$



9. Graph the linear inequality. $3x - y > 0$



10. Find the slope of the line through $(-4, 6)$ and $(-1, -2)$.

11. Find the slope of the line: $2x + y = 10$.

12. Find the slope of the line: $x + 12 = 0$.

WEEK 4

1. Find the slope of a line parallel to the graph of $y - 4 = 6$.	2. Write an equation for the line through $(-1,4)$ with a slope of 2 in <i>slope-intercept</i> form.	3. Write an equation for the line through $(2,-6)$ and $(1,3)$ in <i>slope-intercept</i> form.
4. Decide whether the given relation represents a function or not. If it does, give the domain and range. $\{(2,3), (2,4), (2,5)\}$	5. Decide whether the given relation represents a function or not. If it does, give the domain and range. $\{(0,2), (1,2), (2,2)\}$	6. If $f(x) = 3x + 7$, find $f(-2)$.
7. If $f(x) = 2x^2 - 1$, find $f(-1)$.	8. If $f(x) = x + 3 $, find $f(2)$.	9. Solve the system by <i>substitution</i> : $2x + y = -4$ $x = y + 7$
10. Solve the system by <i>substitution</i> : $4x + 3y = -35$ $x + y = 0$	11. Solve the system by <i>elimination</i> : $2x - y = 4$ $3x + y = 21$	12. Solve the system by <i>elimination</i> : $4x + 2y = 2$ $5x + 4y = 7$
13. Solve the system by <i>elimination</i> : $-8x - 10y = 6$ $4x + 5y = 2$	14. Solve the system by <i>elimination</i> : $6x - 5y = 0$ $-2x + 3y = 0$	15. Solve the system by <i>any method</i> : $\frac{6}{5}x - \frac{1}{3}y = -20$ $-\frac{2}{3}x + \frac{1}{6}y = 11$

WEEK 5

<p>1. The distance between Memphis and Atlanta is 782 mi less than the distance between Minneapolis and Houston. Together, the two distances total 1570 mi. How far is it between Memphis and Atlanta? How far is it between Minneapolis and Houston?</p>	<p>2. Sohail has a 25% solution of alcohol to mix with a 40% solution to get 50 L of a final mixture that is 30% alcohol. How much of each of the original solutions should be used?</p>	<p>3. A chemist needs 12 L of a 40% alcohol solution. She must mix a 20% solution and a 50% solution. How many liters of each will be required to obtain what she needs?</p>
<p>4. Evaluate:</p> 5^{-4}	<p>5. Evaluate:</p> $(-3)^0 + 4^0$	<p>6. Evaluate:</p> $4^{-1} + 3^{-1}$
<p>7. Simplify and write the answer using only positive exponents. Assume that all variables represent nonzero numbers.</p> $\frac{8^{-1} \cdot 8^4}{8^{-2}}$	<p>8. Simplify and write the answer using only positive exponents. Assume that all variables represent nonzero numbers.</p> $\frac{(x^{-3})^{-2} (x^{-1}y)^2}{(xy^{-2})^2}$	<p>9. Combine like terms and write final answer in descending power order.</p> $5x^2 + 8x - 12x^2$
<p>10. Combine like terms and write final answer in descending power order.</p> $13n^3 - n^2 + n^4 + 3n^4 - 9n^2$	<p>11. Simplify:</p> $3x^2(-9x^3 + 6x^2 - 2x + 1)$	<p>12. Multiply:</p> $(x - 8)(x + 3)$
<p>13. Multiply:</p> $(4x + 3y)(2x - y)$	<p>14. Multiply:</p> $(5x - 2y)^2$	<p>15. Multiply:</p> $(10x + 3y)(10x - 3y)$

WEEK 6

1. Factor completely: $12x^2 - 30x$	2. Factor completely: $2m^3n^2 + 3m^3n - 5m^2n^2$	3. Factor completely: $2ax - 2bx + ay - by$
4. Factor completely: $x^2 - 5x - 24$	5. Factor completely: $2x^2 + x - 3$	6. Factor completely: $10x^2 - 17x + 3$
7. Factor completely: $y^2 + 2y + 3$	8. Factor completely: $x^2 + 36$	9. Factor completely: $12 - 6a + 2b - ab$
10. Factor completely: $9y^2 - 64$	11. Factor completely: $4x^2 - 28xy + 49y^2$	12. Factor completely: $-2x^2 - 4x - 2$
13. Factor completely: $x^4 - 81$	14. Factor completely: $81x^4 - 16y^4$	15. Factor completely: $9x^6y^4 + 12x^3y^2 + 4$

WEEK 7

<p>1. The length of a rectangular flower bed is 3 ft less than twice its width. The area of the bed is 54 ft^2. Find the dimensions of the flower bed.</p>	<p>2. Find two consecutive integers such that the square of the sum of the two integers is 11 more than the first integer.</p>	<p>3. The length of the hypotenuse of a right triangle is twice the length of the shorter leg, plus 3 m. The longer leg is 7 m longer than the shorter leg. Find the lengths of the sides of the triangle.</p>
<p>4. Write in lowest terms: $\frac{5a^3b^3}{15a^4b^2}$</p>	<p>5. Write in lowest terms: $\frac{m-4}{4-m}$</p>	<p>6. Write in lowest terms: $\frac{4x^2-9}{6-4x}$</p>
<p>7. Write in lowest terms: $\frac{4p^2+8pq-5q^2}{10p^2-3pq-q^2}$</p>	<p>8. Write in lowest terms: $\frac{6a^2+a-2}{2a^2-3a+1}$</p>	<p>9. Multiply. Write answer in lowest terms. $\frac{6k^2-k-2}{8k^2+10k+3} \cdot \frac{4k^2+7k+3}{3k^2+5k+2}$</p>
<p>10. Multiply. Write answer in lowest terms. $\frac{x^2-10x+25}{9-6x+x^2} \cdot \frac{x-3}{5-x}$</p>	<p>11. Divide. Write answer in lowest terms. $\frac{5(d-2)}{9} \div \frac{3(d-2)}{5}$</p>	<p>12. Divide. Write answer in lowest terms. $\frac{4a^2+9a+2}{3a^2+11a+10} \div \frac{4a^2+17a+4}{3a^2+2a-5}$</p>

WEEK 8

1. Simplify. $\sqrt{\frac{128}{25}}$	2. Simplify. $\frac{20\sqrt{18}}{5\sqrt{3}}$	3. Simplify. $3\sqrt{28} + \sqrt{63}$
4. Simplify. $3\sqrt{27x} - 4\sqrt{48x} + 2\sqrt{3x}$	5. Rationalize the denominator: $\frac{5\sqrt{2}}{\sqrt{7}}$	6. Rationalize the denominator: $\sqrt{\frac{2}{3x}}$
7. Solve. $\sqrt{2x+6} + 4 = 2$	8. Solve. $\sqrt{x+1} = 5 - x$	9. Solve. $(x+4)(x-1) = -6$
10. Solve. $(4x-3)^2 = 9$	11. Solve using the quadratic formula. $2x^2 + 12x = -5$	12. Solve using the quadratic formula. $5m^2 + m = 1$
13. Solve using the quadratic formula. $\frac{3}{2}k^2 - k - \frac{4}{3} = 0$	14. Solve using the quadratic formula. $0.6x - 0.4x^2 = -1$	15. Given $f(x) = 2x^2 - 5x + 3$, find $f(-2)$.

Fractions to Decimals

Directions: Find each decimal equivalent. No calculator allowed! Look for patterns.

$$\frac{1}{8} =$$

$$\frac{1}{6} =$$

$$\frac{1}{10} =$$

$$\frac{1}{4} = \frac{2}{8} =$$

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

$$\frac{1}{5} = \frac{2}{10} =$$

$$\frac{3}{8} =$$

$$\frac{3}{6} =$$

$$\frac{3}{10} =$$

$$\frac{2}{4} = \frac{4}{8} =$$

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

$$\frac{2}{5} = \frac{4}{10} =$$

$$\frac{5}{8} =$$

$$\frac{5}{6} =$$

$$\frac{5}{10} =$$

$$\frac{3}{4} = \frac{6}{8} =$$

$$\frac{3}{5} = \frac{6}{10} =$$

$$\frac{7}{8} =$$

$$\frac{7}{10} =$$

$$\frac{4}{5} = \frac{8}{10} =$$

$$\frac{9}{10} =$$

Answer Key

<p>Week 1:</p> <ol style="list-style-type: none">1. $\frac{6}{5}$ or $1\frac{1}{5}$2.3. $\frac{241}{120}$ or $2\frac{1}{120}$4.5. true6.7. 48.9. 210.11. B12.13. -7014.15. 64	<p>Week 2:</p> <ol style="list-style-type: none">1. $x = -6$2.3. \emptyset4.5. all real numbers6.7. $z = 6$8.9. 2300 mi10.11. 4 hr12.13. $(-2, 6]$14.15. 83 or more	<p>Week 3:</p> <ol style="list-style-type: none">1. -6, -10, -52.3. x-int: (2,0); y-int: (0,6)4.5. x-int: (-3,0); y-int: none6.7. x-int: (4,0); y-int: (0,-4)8.9. Dashed line; shade to the right10.11. -212.
<p>Week 4:</p> <ol style="list-style-type: none">1. 02.3. $y = -9x + 12$4.5. yes; D: {0,1,2}; R: {2}6.7. 18.9. (1, -6)10.11. (5, 6)12.13. \emptyset14.15. (-15, 6)	<p>Week 5:</p> <ol style="list-style-type: none">1. Memphis to Atl: 394 mi; Minn. to Houston: 1176 mi2.3. 4 L of 20%; 8 L of 50%4.5. 26.7. 8^58.9. $-7x^2 + 8x$10.11. $-27x^5 + 18x^4 - 6x^3 + 3x^2$12.13. $8x^2 + 2xy - 3y^2$14.15. $100x^2 - 9y^2$	<p>Week 6:</p> <ol style="list-style-type: none">1. $6x(2x - 5)$2.3. $(2x - y)(a - b)$4.5. $(2x + 3)(x - 1)$6.7. prime8.9. $(2 - a)(6 + b)$10.11. $(2x - 7y)^2$12.13. $(x^2 + 9)(x + 3)(x - 3)$14.15. $(3x^3y^2 + 2)^2$

Week 7:

1. 6 ft by 9 ft
- 2.
3. 5m, 12m, 13m
- 4.
5. -1
- 6.
7. $\frac{2p+5q}{5p+q}$
- 8.
9. $\frac{3k-2}{3k+2}$
- 10.
11. $\frac{25}{27}$
- 12.

Week 8:

1. $\frac{8\sqrt{2}}{5}$
- 2.
3. $9\sqrt{7}$
- 4.
5. $\frac{5\sqrt{14}}{7}$
- 6.
7. \emptyset
- 8.
9. $x = -2, -1$
- 10.
11. $x = \frac{-6 \pm \sqrt{26}}{2}$
- 12.
13. $k = -\frac{2}{3}, \frac{4}{3}$
- 14.
15. 21

Fractions to Decimals:

.125	$.\overline{16}$.1
.25	$.\overline{3}$.2
.375	.5	.3
.5	$.\overline{6}$.4
.625	$.\overline{83}$.5
.75		.6
.875		.7
		.8
		.9