Seventh Grade Honors Summer Math
(entering 8H Algebra)

Week 1 – Exponents, GCF, and LCM

1. Find the greatest common factor (GCF) of the monomials.

   $6fgh^2$, $3f^2h$, $12g^2h$

2. Find the least common multiple (LCM) of $12x^6y^9$ and $16yz$

3. Simplify: $\dfrac{3m^5 \bullet 5m^2}{6m^3}$

4. Solve for ?: $\dfrac{x^{12}}{x^{?}} = x^{-5}$

5. Find the value of n that makes $4^{3n} \bullet 4^{n-2} = 4^{18}$

Simplify the expression. Write your answer using exponents.

6. $(-6a^7b^4)(3a^3b^5)$

7. $\left(\dfrac{2w^3}{v}\right)^3 \bullet \dfrac{1}{6w^3}$

Simplify the expression. Write your answer using only positive exponents.

8. $\dfrac{3^{-4}}{3^{-7}}$

9. $\left(\frac{q^2}{5}\right)^{-2}$

10. $4^{-2}\left(\frac{6}{11^0}\right)$

Week 2 –Linear Algebra

1. Is the relation a function. Explain your reasoning.

   (-16, 8), (-8, 16), (16, 4), (-4, 2), (2, -4), (4, -2)

2. Write the equation in function form. Then graph the equation.

   4(x + 3y) – 24 = 0

3. Find the value of a that makes the ordered pair a solution of the equation.

   6y – 11x = -4; (a – 1, -8)

4. Find the intercepts of the equation's graph. Then graph the equation.

   y = $\frac{6}{11}x + 6$

5. Find the slope of the line through (-1, -15), (-26, -10)

6. For the line with the given equation, find the slope of a parallel line and the slope of a perpendicular line.

   13y – 8x + 52 = 0

7. Write an equation of the line that passes through (1,1) and is parallel to the line passing through (2, 3) and (1, 5).

8. What function has the values f(-3) = -11 and f(2) = -1?

9. Write a linear function g whose graph passes through (-2, 2) and is perpendicular to the graph of f(x) = $-\frac{3}{2}x+5$.

10. What is the equation of the vertical line that passes through the point (6, -2)?

Week 3 Equations and Inequalities

Solve the equation. Clear the fraction or decimal if necessary.

1. 9(4h – 6) = 2(-13 – 2h)

2. 4.5x + 3.4 = 1.5x – 2.6

3. $\frac{1}{4}(9-2x)=\frac{1}{8}(3x+4)$

Use percent equation **and** a proportion to answer the question.

4. 121.1 is what percent of 140?

5. What number is 105% of 350?

Solve the inequality or absolute value equation. Graph your solution.

6. 4(5 -3b) > 4b + 4

7. $\frac{-5x-8}{4} \geq -22$

8. $4|5+2x| = -16$

9. $7 \leq -x - 4 \leq 12$

10. $\frac{1}{2}(x+18) > 6$ or $7x + 5 < -51$

Solve the equation. Isolate the w^2. Round to the nearest hundredth if necessary.

11. $2w^2 + 3 = 104$

Write an equation for each problem and then solve.

12. A new plasma-screen television costs $5250. A family makes a down payment of $552 and pays off the balance in 24 equal monthly payments. Write and solve an equation to find the monthly payment.

13. The perimeter of a rectangle with a width of (2x + 3) cm and a length of 5x cm is 41 centimeters. What is the value of x?

14. To become a member of an ice skating rink, you have to pay a $30 membership fee. The cost of admission to the rink is $5 for members and $7 for nonmembers. After how many visits to the rink is the total cost for members, including the membership fee, the same as the total cost for nonmembers?

15. Find four consecutive even integers if the sum of the second and third is 2 less than 4 times the fourth.

16. You purchase 5 tickets to a football game from the internet ticket agency. In addition to the cost per ticket, the agency charges a convenience charge of $2.50 per ticket. You choose to pay for rush delivery, which costs $15. The total cost of your order is $352.50. What is the price per ticket not including the convenience charge?

17. The mean of 3x, 2x + 5, 4x – 11, and 18 – x is equal to 21. Write an equation and solve for x.

18. In Friday's basketball game, Aidan made six more baskets than Bryce. Bryce made twice as many baskets as Ryan. Together, the three players made 56 baskets. Write an equation to represent this situation. Find the number of Baskets each person made.

Week 4 – Fractions and Proportions

Evaluate the expression.

1. $4\frac{1}{2}+3\frac{2}{3}-1\frac{8}{9}$

2. $-\frac{9}{11}-\frac{4}{5}\bullet 2\frac{1}{2}$

Solve the equation by first clearing the fraction.

3. $\frac{1}{3}g+\frac{1}{12}=\frac{1}{4}$

Find the value of x.

4. $\frac{x-7}{10}=\frac{x}{5}$

5. Elly spent 3/5 of her money on a manicure and had $45 left. How much money did she have at first?

6. A 12 ounce box of pasta costs $.99. A 2 pound box costs $2.09. Which box has the lower price per ounce? You buy 6 pounds of pasta. How much money do you save if you buy pasta in the box with the lower price per ounce? Explain.

7. If 3/8 of a sum of money is $384, what is ¼ of the money?

8.. A map has a scale of 1 inch : $2\frac{1}{2}$ miles. Use the given map distance of $\frac{1}{8}$ inches to find the actual distance.

9. The ratio of male to female faculty is 3 : 5. If there are 56 faculty members, how many are females?

10. You are on the school track team, and you participate in the long jump competition. This week, you jumped a length of 17 feet, $5\frac{1}{4}$ inches. Last week, you jumped a length of 14 feet, $9\frac{3}{4}$ inches. How much farther did you jump this week than last week?

11. Of the three different types of nuts in a nut mixture, 1/3 are peanuts, 3/8 are cashews, and the rest are almonds. What fraction of nuts are almonds?

Week 5 – Percents

Use percent equation to answer the questions for #1 and #2.

1. 25.2 is 42% of what number?

2. What percent of 600 is 19?

Write an equation for each problem and then solve.

3. After completing 10 laps in the Daytona 500, a driver has completed 5% of the race. How many laps does the race have?

4. The price for a token to ride a city's subway system is changing from $1.25 to $1.50. Find the percent of change.

5. A store marks up the wholesale price of an item by 42%. The retail price is $75.97. What is the wholesale price?

6. You deposit $4280 into a savings account that earns 1.75% interest **compounded** annually. Use a calculator to find the balance of the account after 8 years. Round your answer to the nearest cent.

7. A laptop computer is on sale for 10% off the original price of $1500. When it doesn't sell, the laptop goes on sale for 15% off the sale price. What is the new sale price of the laptop?

8. Which situation results in a greater final amount, an 80% markup of the wholesale price followed by a 30% discount of the retail price, or a 30% markup of the wholesale price followed by an 80% discount of the retail price? Justify your answer.

9. You are making cupcakes for a bake sale. So far, you have made 60 cupcakes. Of those, 24 are vanilla and 36 are chocolate. You want the chocolate cupcakes to make up 70% of the total number of cupcakes. Write and solve a proportion to find the number of chocolate cupcakes that need to be added.

10. If you decrease 135 by 22%, what is the new amount?

Week 6 – Geometry

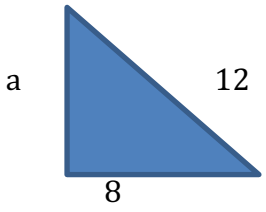
1. For line segment AB with midpoint M, determine the coordinates of point B.

   A(-1,7); M = (1, 2)

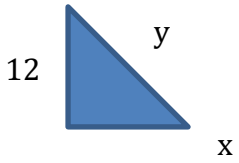
2. Find the distance between the points. Write your answer in simplest form.

   (-3, 2), (4, -2)

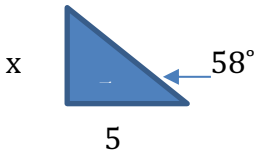
3. Find the unknown length of the right triangle. Write your answer in simplest form.



4. Find the unknown lengths of the 45˚, 45˚, 90˚ triangle. Write your answer in simplest form.



5. Use a calculator to find the value of x for the right triangle. The bottom right angle is 58˚. Round to the nearest tenth.



6. The perimeter of an isosceles triangle is 71 meters. The length of the first side is 28 meters, and the length of the second side is 1 more than half the length of the first side.
Find the lengths of the second and third sides of the triangle. Then classify the triangle according to its side lengths.

7. A circle has a circumference of 500 feet. Find the approximate area of the circle.

8. You are wrapping a gift box that is 16 inches long, 7 inches wide, and 9 inches tall. Find the amount of wrapping paper you need to wrap the gift box to the nearest square inch.

9. The ratio of the angle measures of a triangle is 2 : 3 : 7. Find the angle measures. Then classify the triangle by its angle measures.

10. The area of a trapezoid is 68 square feet. The height is 8 feet and one of the bases is 11 feet. Find the length of the other base of the trapezoid.

11. Find the surface area of a cylinder with a height of 12 meters and a radius of 15 meters. Round to the nearest whole number. Use 3.14 for π.