Geometry Honors

Summer Math
Skills Review

2019-2020

Please bring completed packet to the first day of class on August 12, 2019 (A day) or August 13, 2019 (B day).

Use a separate sheet of paper if needed. Make sure to follow directions and show your thinking!

Congratulations on your placement into Geometry Honors!

This packet needs to be completed by the first day of class, August 12 (A day) or August 13 (B day). This packet will be checked and a large quiz will be given over the concepts. There will be a few days of review over the packet before the quiz will be given. All of the material in this packet is review from your previous math courses.
If you are having trouble remembering how to complete some of the problems, please look at khanacademy.org. You will find some great videos that will help right away.

REQUIRED CALCULATOR:

TI-84 PLUS

**** If anyone loses their packet, they can be printed off www.mchs.net. They can be found under Students & Parents, then Honors/AP Information or under your graduating class page (Class of 2023).****

Linear Equations

The successful completion of a Geometry problem often requires knowledge of solving equations. We often work with measures that are equal and contain variables. It is vital that you can correctly solve to determine the value of variables.

Solve each equation.

1. $12 - x = -5$

2. $\frac{3}{4}m = 21$

3. $-9 - 4y = 6 + y$

4. $15 - (8 - 6b) = 4b + 3$

5. $3(2x - 5) = 6x + 7$

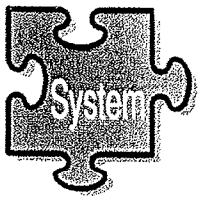
6. $3 - 2(x + 1) = x - 11$

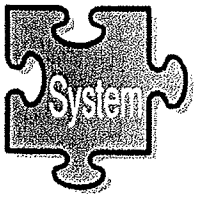
7. $\frac{2}{3} - x + 5x = \frac{1}{2} + x$

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

9. $3(2x - 7) - (x + 5) = -6$

10. $7x - 2 = 5x$





Systems of Linear Equations

If there were only one page to identify as the most important in this packet, it would probably be this page. We frequently have to set up and solve systems of equations in Honors Geometry. Students who are masters of this material tend to find a lot of success in the first few chapters of Honors Geometry. Conversely, students who do not know how to solve systems struggle greatly. If you cannot solve a system, you must learn before you even think about entering an Honors Geometry classroom.

Solve each system using the substitution or elimination method.

1. $y = 2x + 1$
   $x + y = 16$

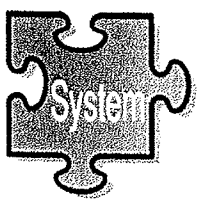
2. $-2x + 3y = 14$
   $x + 2y = 7$

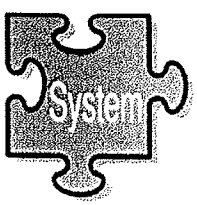
3. $2y = x - 2$
   $5x - 3y = -11$

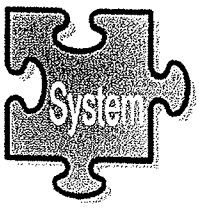
4. $4x + 6y = -5$
   $8x = 12y - 10$

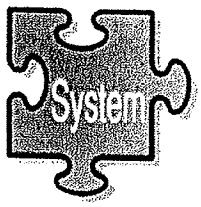
5. $2x - y = 7$
   $2y = 4x + 8$

6. $x - y = 3$
   $6x + 4y = 13$









Systems Page 2

7. $\frac{1}{4}x - y = 7$
$x - 4y = 28$

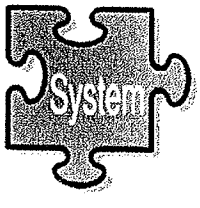
8. $y = x + 4$
$y = -3x - 4$

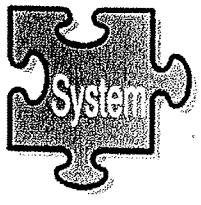
9. $7x - 3y = -5$
$3x + 2y = 11$

10. $\frac{x}{6} + \frac{y}{4} = \frac{5}{2}$
$\frac{2x}{3} - \frac{y}{2} = -2$

11. $8x - 8y = 13$
$4x - 5y = 6$

12. $5x = 2 - 3y$
$6y = 4 - 10x$





Solving Quadratic Equations by Factoring

When setting up and solving equations in Honors Geometry, we sometimes create quadratic equations. In these problems, you will encounter an x^2 in addition to an x. There are several ways to approach solving one of these problems. The most commonly used method in Geometry is to factor the equation and then apply the zero property of multiplication, which states that any number multiplied by 0 will result in 0.

Solve each equation by factoring.

1. $(x+6)(x-2)=0$

2. $x(x+11)=0$

3. $(x-19)(x+1)=0$

4. $(2x-8)(3x+1)=0$

5. $x^2+8x+7=0$

6. $x^2-2x-24=0$

7. $4x^2+4x+1=0$

8. $3x^2-6x-45=0$

9. $x^2-169=0$

10. $25x^2-256=0$

11. $x^2+10x=-25$

12. $s^2-14s=-45$

13. $x^2-4x=21$

14. $2x^2-11x=-12$

15. $3x^2+17x=-10$

16. $9x^2=16$

17. $9r^2+30r+25=0$

18. $x^2=-6x$

Writing Algebraic Models

Honors Geometry problems often begin with information on a diagram or in a sentence. This information must be interpreted and represented using an equation. This page will require you to take information from a sentence and translate it into an algebraic equation.

Translate the following into algebraic equations. Do not solve the equations.

1. Fourteen more than twice a number is 59.

2. Three less than a number is five times the same number.

3. The length of a rectangle is seven more than the width. The area is 48.

4. Five ninths of the difference of a number and 32 yields 20.

5. Fifty – five percent of a number is one more than the product of five and that number.

6. The sum of three consecutive integers is 89.

7. A number squared is equivalent to 16.

8. The quotient of a number and seven results in the ratio of three and that same number.

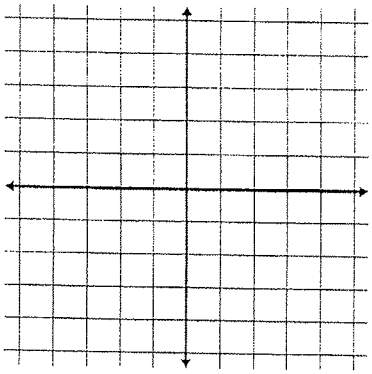
9. A number is less than four.

Coordinates

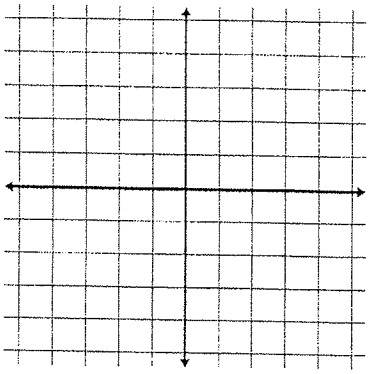
Many problems in Honors Geometry will ask you to work with points on a coordinate plane. These points will be written in the form of an x value followed by a y value (x, y). It is important that you know how to plot these points and perform calculations using them.

Plot both points on the coordinate plane and determine the distance between the two points.

1. (4,–4) and (4,3)



2. (–5,3) and (2,3)



It is sometimes necessary to find the distance between two points that are not on the same horizontal or vertical line. To find such distances, we use the following formula: $D = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ where (x_1, y_1) is the first point and (x_2, y_2) is the second point. Use this formula to determine the distance between the two points.

3. (3,–6) and (9,2)

4. (0,–8) and (2,–2)

Another important calculation is the slope of a line. To determine the slope of a line, we can use the formula $m = \frac{y_2 - y_1}{x_2 - x_1}$ Use this formula to determine the slope of the line connecting the two points.

5. (8,5) and (–3,5)

6. (12,5) and (–2,3)

π Page

In Honors Geometry, we often have to work with the number π. Unlike in previous classes, you will not approximate π as 3.14, but will instead keep your answers "in terms of π." When working with π, treat it like you would a variable. For example, if you were to add 4π and 8π, the answer in terms of π would be 12π.

Simplify each expression completely. Leave answers in terms of π and express decimal answers in fraction form.

1. $(2)(\pi)(8)$

2. $(\pi)(5^2)$

3. $\left(\frac{60}{360}\right)(2)(\pi)(12)$

4. $\left(\frac{90}{360}\right)(\pi)(12^2)$

5. $8\pi + 22\pi$

6. $100\pi - 71\pi$

7. $\frac{52\pi}{13\pi}$

8. $(2)(\pi)(8) - \left(\frac{1}{2}\right)(5)(4)$

9. $(\pi)(6^2) - \left(\frac{1}{2}\right)(\pi)(2^2)$

10. $15^2 - (\pi)(7^2)$

11. $\left(\frac{50}{360}\right)(2)(\pi)(6)$

12. $\left(\frac{100}{360}\right)(\pi)(4^2)$

Radicals

Geometry often utilizes radical expressions. When working with triangles, it is usually desirable to express answers in radical form rather than as rounded decimals. This page will offer you practice in reducing radical expressions.

Simply each expression completely. Express your answers in radical form.

1. $\sqrt{28}$

2. $\sqrt{72}$

3. $\sqrt{500x^2}$

4. $\sqrt{74}$

5. $\dfrac{8}{\sqrt{2}}$

6. $\dfrac{12}{\sqrt{3}}$

7. $\left(\sqrt{3}\right)^2$

8. $\left(\sqrt{20}\right)^2$

9. $\left(3\sqrt{5}\right)^2$

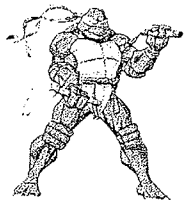
10. $\left(\dfrac{\sqrt{3}}{2}\right)^2$

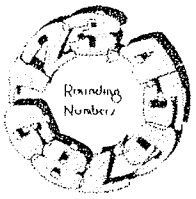
11. $\left(2\sqrt{3}\right)\left(5\sqrt{2}\right)$

12. $\left(7\sqrt{5}\right)\left(3\sqrt{10}\right)$

13. $\left(\dfrac{1}{2}\right)(6\sqrt{3})(6)$

14. $\left(\dfrac{1}{2}\right)(5)(7\sqrt{2})+(8)(15\sqrt{2})$





Rounding

On some occasions, Geometry problems will require you to express a solution as a decimal rounded to a specific place. When asked to round, do not round answers until the final step of any problem.

Round the following numbers to the nearest hundredth.

1. 0.9762

2. 3.19999

3. 15.0003

4. 137.445

Round the following numbers to the nearest integer.

5. 205.67

6. 900

7. 0.894

8. 59.29

Simplify the expressions. Round your answers to the nearest tenth.

9. $96.79 + 101.567$

10. $1.973 + 9.025$

11. $\sqrt{7} + \sqrt{5}$

12. $2\pi - 19.75$

13. $5\sqrt{12.6} + \frac{1}{2}\pi \cdot 4^2 + 36\sqrt{3}$

14. $\frac{5 - 2\sqrt{2}}{6}$