Honors Integrated Math 2 Summer Assignment

The rigor of the Honors Integrated Math curriculum includes fluency of procedures, mathematical understanding of concepts, and the ability to apply concepts to real-life situations. Retaining mathematical concepts and practicing mathematical fluency both are essential for students to succeed in Putnam County.

The attached assignment is due on the first day of your Honors Integrated Math 2 class.

This material is mostly a review of basic skills you are expected and required to have mastered for this course.

The assignment is to be completed on separate notebook paper with each question clearly labeled. Only the solutions to graphs (grids/number lines) go directly on the packet. All other work and solutions must be on your paper stapled to the packet. **While arriving at the correct answer is important, students are expected to understand *how* to arrive at the correct answer.** We do **NOT** accept just answers. **All work must be shown**.

You are to bring the completed work with you to the first day of class and your teacher will answer any questions you may have at that time.

A test will be administered on the material during the first week of school to determine your eligibility to remain in the course.

Anything you need to review should be researched. We suggest the websites below.
www.purplemath.com www.khanacademy.com www.helpingwithmath.com

The mathematics department is very excited to see our students ready for the curriculum in July!

Sincerely,

Putnam County Schools, Tennessee

Cookeville High School	Algood Middle School
Monterey High School	Avery Trace Middle School
Upperman High School	Prescott South Middle School
	Upperman Middle School

HONORS CRITERIA

Honors courses will substantially exceed the content standards, learning expectations, and performance indicators approved by the State Board of Education. Teachers of honors courses will model instructional approaches that facilitate maximum interchange of ideas among students: independent study, self-directed research and learning, and appropriate use of technology. All honors courses must include multiple assessments exemplifying coursework (such as short answer, constructed-response prompts, performance-based tasks, open-ended questions, essays, original or creative interpretations, authentic products, portfolios, and analytical writing). Additionally, an honors course shall include a minimum of five (5) of the following components:

1. Extended reading assignments that connect with the specified curriculum.

2. Research-based writing assignments that address and extend the course curriculum.

3. Projects that apply course curriculum to relevant or real- world situations. These may include oral presentations, power point presentations, or other modes of sharing findings. Connection of the project to the community is encouraged.

4. Open-ended investigations in which the student selects the questions and designs the research.

5. Writing assignments that demonstrate a variety of modes, purposes, and styles.

    a. Examples of mode include narrative, descriptive, persuasive, expository, and expressive.
    b. Examples of purpose include to inform, entertain, and persuade.
    c. Examples of style include formal, informal, literary, analytical, and technical.

6. Integration of appropriate technology into the course of study.

7. Deeper exploration of the culture, values, and history of the discipline.

8. Extensive opportunities for problem solving experiences through imagination, critical analysis, and application.

9. Job shadowing experiences with presentations which connect class study to the world of work.

Additional components of study may also be included in the honors curriculum.
These are simply the MINIMUM requirements of the course.

Honors Integrated Math 2 Summer Assignment

SHOW ALL WORK on a separate sheet of paper and staple it to the packet.

Part 1: Algebra Skills Review

1. Use the expression $10x^2-2x+4x^2+3x-12$ to answer the following questions.

a. How many terms are in the simplified form of the expression?

b. What are the coefficients in the simplified form of the expression?

2. The set of natural numbers are {0, 1, 2, 3, …}. Which of these radicals have natural number solutions?

a. $\sqrt{50}$ b. $\sqrt{25}$ c. $\sqrt{9}+\sqrt{4}$ d. $\sqrt{6}$

3. Simplify the following radicals

a. $\sqrt{72}$ b. $\sqrt{68}$ c. $\sqrt{48}\cdot\sqrt{8}$ d. $2\sqrt{24}$

4. These should be completed without a calculator.

a. Evaluate: $\frac{1}{3}\cdot\frac{3}{7}\cdot\frac{8}{2}$

b. Circle any values that are equivalent

$$\frac{2}{5},\frac{6}{8},\frac{6}{15},\frac{9}{30},\frac{14}{35},\frac{20}{50}$$

c. Evaluate: $\frac{2}{3}+\frac{5}{8}$

d. Evaluate: $\frac{2}{3}-\frac{7}{4}$

e. Evaluate: $\frac{2}{5}\div\frac{4}{3}$

f. Convert to an improper fraction $6\frac{3}{4}$

5. Simplify the following expressions

a. $11(a+5b-3c)$ b. $7-5(y-11)$ c. $2(3z+1)-(z-6)$

6. The prime factors of $1176=2\cdot2\cdot2\cdot3\cdot7\cdot7=2^3\cdot3\cdot7^2$. What are the prime factors of the following:

a. 98 b. 810 c. 72

Part 2: Linear Review

7. Which of the following could be the equation of the line graphed? Circle all that apply.

a. $f(x)=\frac{1}{3}x+5$

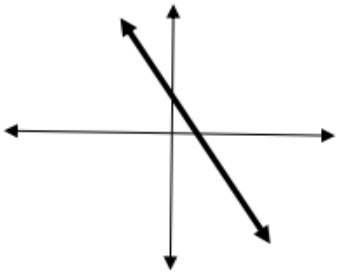
b. $f(x)=-250x+485$

c. $f(x)=\frac{4}{7}x-15$

d. $23x+16y=200$

e. $47y-27x=110$

f. $60x+81y=-90$



8. If the given table represents a linear function, which of the following is true? Circle all that apply.

a. The y–intercept of the graph is negative.

b. The function is decreasing.

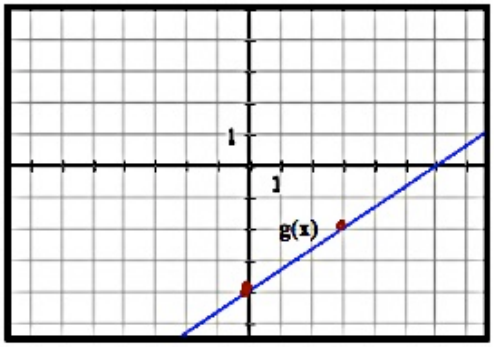
c. The graph of the function has an asymptote at $y = -13$.

d. $f(2) = -1$

x	$f(x)$
−6	−13
−4	−10
2	−1
4	2

9. Given the table and the graph below, which of the following statements is true about the linear functions $f(x)$ and $g(x)$?

x	$f(x)$
−9	−10
−6	−6
−3	−2
0	2



a. The function $f(x)$ has a greater rate of change than the function $g(x)$.

b. The function $g(x)$ has a greater rate of change than the function $f(x)$.

c. The rates of change for both $g(x)$ and $f(x)$ are equal.

d. The rates of change cannot be determined.

10. Given that $f(x)$ is linear and $g(x)$ is exponential, which has a greater rate of change in the domain [1, 5]?

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

x	1	2	3	4	5
$f(x)$	7	12	17	22	27

11. Create an equation for the following scenarios.

a. John is doing a pushup challenge. On day one he does three pushups. Each day after the first John will do 10 pushups per day. Write a function $p(d)$ for the number of pushups John will do on day d.

b. A cable company charges a $50 set up fee and $100 per month. Write a function $p(m)$ for the price for m months.

c. You go to the store and buy 5 apples and 4 oranges for $8.75. Write an equation to represent the cost of an apple, x, and an orange, y.

12. What are the general linear equations for standard form, point-slope, and slope-intercept?

13. What is the equation of the vertical line going through the point (5, 3)?

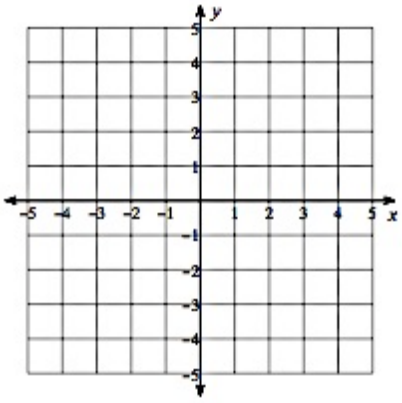
Part 3: Systems Review

14. The measure of the length of a rectangle is 2 less than 5 times the measure of the width. If the perimeter of the rectangle is 32 units, what is the measure of the length?

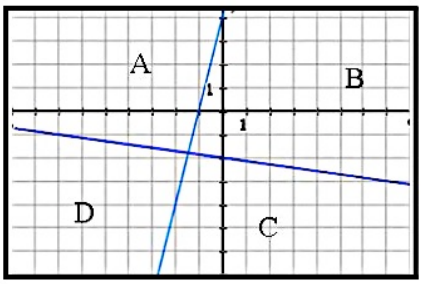
15. Solve the system using the substitution method. $\begin{cases} -x+8y=21 \\ x=8y-21 \end{cases}$.

16. Solve the system using the elimination method. $\begin{cases} -6x-7y=-22 \\ x+5y=19 \end{cases}$

17. Solve the system using the graphing method. $\begin{cases} y=\frac{1}{4}x-3 \\ 4y-4=-3x \end{cases}$



18. Which region (A, B, C, or D) would be shaded to represent the correct solution to the system of linear inequalities $\begin{cases} 7y+x\le -14 \\ 4x-y\le -4 \end{cases}$

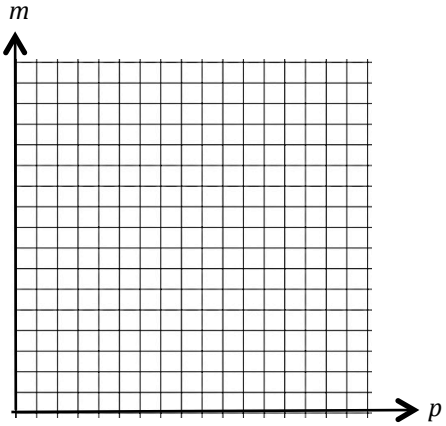


19. Sarah is purchasing plates and mugs for her house. She would like to buy at least 8 items. Determine the possibilities if the plates cost \$8 each and the mugs cost \$7 each, and she plans to spend no more than \$112.

a. Write a system of inequalities to represent the number of plates, *p*, and mugs, *m*, Sarah could buy.

b. Graph the system of inequalities.

c. Give one possible combination of plates and mugs she could buy for her house.



Part 4: Exponential Review

20. Explain why the expression $2 \cdot 3^x$ is not equivalent to the expression 6^x.

21. What value can be placed in each box to create a true statement?

a. $\left(b^{\square}\right)^5 = b^{15}$

b. $g^{\square} \bullet g^6 = g^{11}$

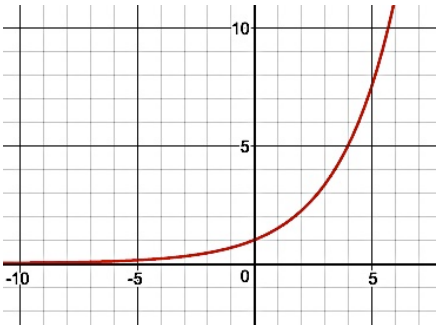
c. $(a^2 \bullet a^{\square})^3 = a^{18}$

22. Simplify the following exponential expressions. Answers should not contain negative exponents.

a. $\left(4x^2\right)^2$ b. $\left(2x^{-3}y^3 \cdot 2x^3y^{-3}\right)^{-3}$ c. $\left(\dfrac{m^{-1}n^2}{\left(m^{-2}n^{-2}\right)^0}\right)^{-2}$

23. Which of the following statements is true about the functions $f(x)$ and $g(x)$?

$f(x) = 3(2)^x$ $g(x) =$



a. The y–intercept of function $f(x)$ is less than the y–intercept of the function $g(x)$.

b. The y–intercept of function $f(x)$ is greater than the y–intercept of the function $g(x)$.

c. The y–intercept of function $f(x)$ is equal to the y–intercept of the function $g(x)$.

d. The y–intercepts cannot be determined.

Part 5: Functions Review

24. If $f(x) = -3x + 2$ and the domain of f is {3, 4, 5}, what is the range of $f(x)$?

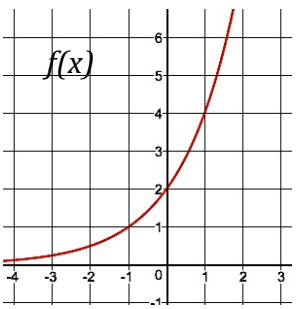
25. Use the functions $f(x)$ and $g(x)$ to the right

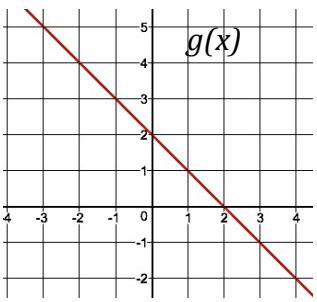
a. What are the values of $f(1)$ and $g(-3)$

b. What does the point (0, 2) represent?

c. True or false? $f(-2) > g(3)$

d. True or false? $f(-4)$ is negative.

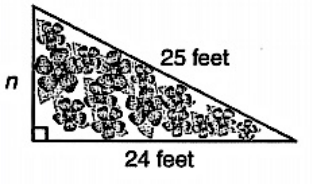




Part 6: Basic Geometry Review

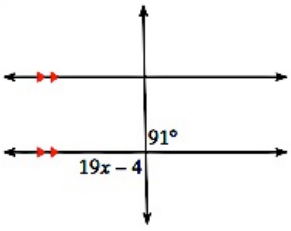
26. If a right triangle has legs of 4in and 5in, use the Pythagorean Theorem to find the length of the hypotenuse.

27. Jenny is planning a right triangular garden. She marked two sides that measure 24 feet and 25 feet. What is the length of the side labeled *n*?

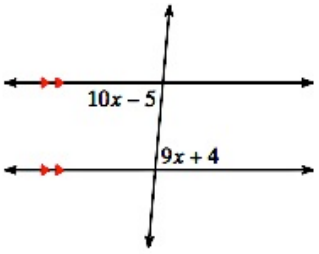


28. Name the angle pair relationship (linear pair, vertical, same side interior, alternate interior, same side exterior, alternate exterior, or corresponding) and solve for *x* in each figure below.

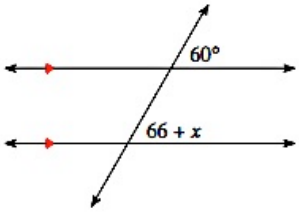
a.



b.



c.



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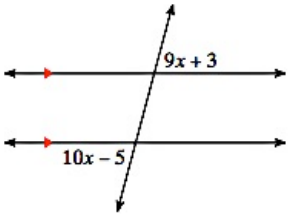
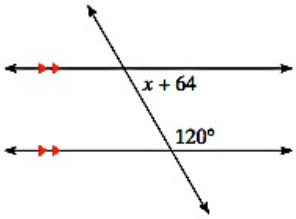
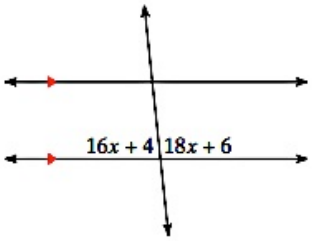


e.



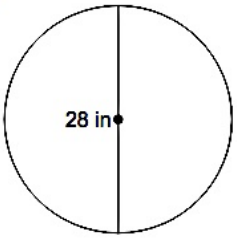
f.



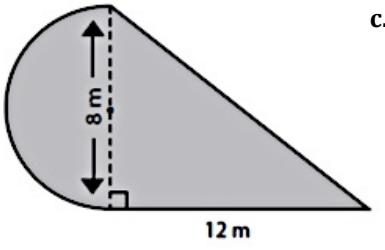
29. What is the circumference of a circle with an area of 144π cm²?

30. Determine the area of the following figures. Round to the nearest hundredth.

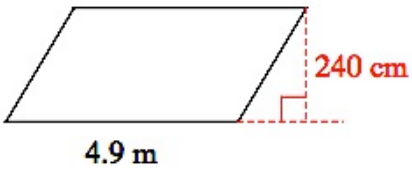
a.



b.



c.



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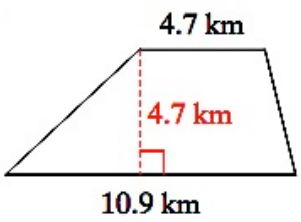

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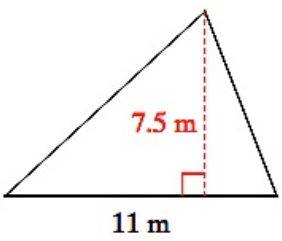

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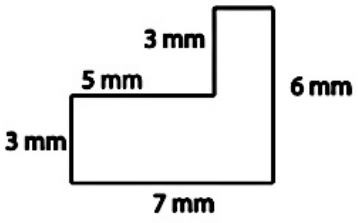


Part 7: Transformations

31. Write the following transformation rules. The first one is done for you.

a. 180 degree rotation about the origin: $(x,y)\rightarrow(-x,-y)$

b. 90 degree rotation counterclockwise (CCW) about the origin: $(x,y)\rightarrow(\_\_\_\_\_,\ \_\_\_\_\_)$

c. 270 degree rotation counterclockwise about the origin: $(x,y)\rightarrow(\_\_\_\_\_,\ \_\_\_\_\_)$

d. Reflection across the x–axis: $(x,y)\rightarrow(\_\_\_\_\_,\ \_\_\_\_\_)$

e. Reflection across the y–axis: $(x,y)\rightarrow(\_\_\_\_\_,\ \_\_\_\_\_)$

f. Reflection across the line $y = x$: $(x,y)\rightarrow(\_\_\_\_\_,\ \_\_\_\_\_)$

g. Reflection across the line $y = -x$: $(x,y)\rightarrow(\_\_\_\_\_,\ \_\_\_\_\_)$

h. Translation left two units and up three units: $(x,y)\rightarrow(\_\_\_\_\_,\ \_\_\_\_\_)$

i. Translation down five units and right six units: $(x,y)\rightarrow(\_\_\_\_\_,\ \_\_\_\_\_)$

32. Transform the following points given the rule.

a. (–2, 3) 90 degree CCW about the origin.

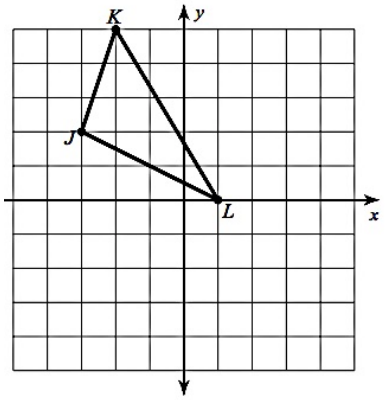
b. (0, 5) Reflection across the x–axis.

c. (7, –12) Down 3 units and right 5 units.

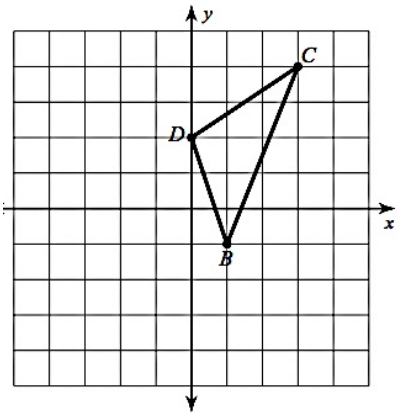
d. (3, 8) Reflection across the line $y = x$

33. Graph the following transformations.

a. rotation 180° about the origin

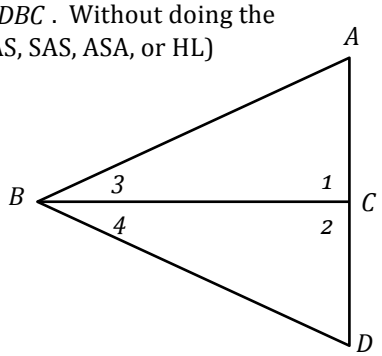


b. reflection across $x = -1$



Part 8: Triangle Congruence and Proof

34. Given the information stated in each exercise, you are to prove $\Delta ABC \cong \Delta DBC$. Without doing the proof, state the method you would use to prove them congruent. (SSS, AAS, SAS, ASA, or HL)



a. Given: AB = BD; AC = CD _____

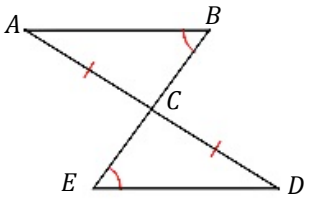
b. Given: $\angle ABC \cong \angle DBC$; AB = BD _____

c. Given: $\angle 1$ & $\angle 2$ are right angles; $\angle 3 \cong \angle 4$ _____

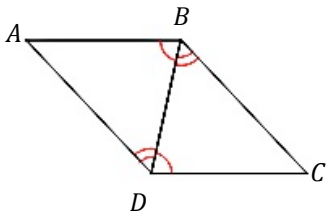
35. In a triangle, one angle measures 82° while another measures 52°, what is the measure of the third angle?

36. In each of the figures below, write a congruence statement for the figures AND the postulate (SSS, AAS, SAS, ASA, or HL) that proves that the triangles are congruent.

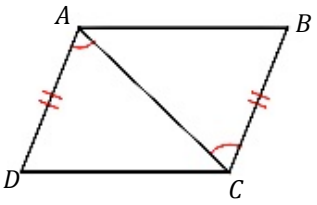
a.



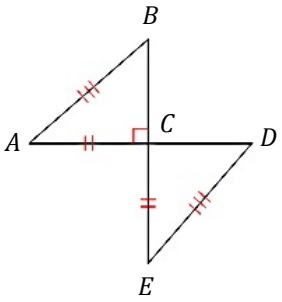
b.



c.



d.



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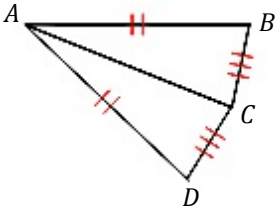

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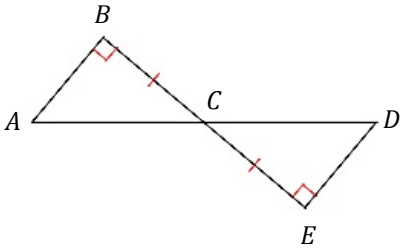


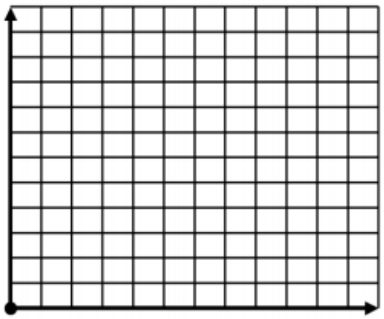
Part 9: Data and Statistics Review

37. A bag contains 45 dyed eggs; 15 yellow, 12 blue, and 18 green. What is the probability of selecting a blue or green egg?

38. A bowl has 10 whole wheat crackers, 16 sesame crackers, and 14 rye crackers. What is the probability of choosing a wheat or rye cracker when choosing one randomly?

39. Use the given data to create a scatterplot, draw a line of best fit and describe the correlation (positive or negative).

Temp (F°)	Water consumed in a day (oz)
99	48
85	27
97	48
80	16
92	32
88	34
94	40
83	20



40. Use the data to predict how much money Sarah would be paid for babysitting 7.5 hours.

Amount Sarah Makes Babysitting

Hours	1	2	3	4	5	6	7	8
Amount	$4	$8	$12	$16	$20	$24	$28	$32