

8th Grade Algebra 1 Honors: Prerequisite Summer Packet



Dear honors math student:

Congratulations on your decision to take Algebra 1 Honors during eighth grade! Algebra 1 Honors will allow you to take calculus during your senior year. Recent research has found that students who take AP courses (such as calculus) in high school are 20% more likely to graduate from college in four years. Successful completion of Algebra 1 Honors will open doors for you in your future studies and career choices.

This opportunity requires a lot of effort: in this case, you will be expected to do your work at a deeper level and a faster pace than was required of you in 7th grade honors math. You are continuing in honors math because your teachers and parents know that you are up to the challenge.

As this course focuses on higher-level math concepts, we will not review pre-algebra material. You are strongly encouraged to complete the review work before school starts in August.

You are being provided with a set of review problems to practice. These problems have been selected by Algebra 1 Honors teachers and they represent some of the most important skills you need to have to be successful in Algebra 1 Honors. The work you do over the summer should be turned in to your Algebra 1 Honors teacher on the first day of school. If you do the recommended summer work, you will find that you are better prepared to move ahead quickly into new material. If you do not complete the summer packet, you will probably need some extra help during the year to catch up to your classmates. Completion of the summer work will give you a confident and positive start, setting you up for greater success in your study of algebra.

As well as completing the summer packet, you should purchase a graphing calculator to help with the course work in Algebra 1 Honors. Graphing calculators are required for all Algebra I Honors classes at District 202 high schools and middle schools. All students will need to bring a graphing calculator to class every day. The following graphing calculators are recommended: Texas Instruments 84 (any type) and TI-Nspire (not CAS version). TI-84 is preferred over N-spire as it is more often used. If you already have a graphing calculator and it is not one of those listed, please contact your school. We do not want you to buy one of these if the one you already have will work! Please do not buy the TI-Nspire CAS or the TI-89, as they are not allowed on most college entrance examinations.

We hope you enjoy your summer break, and enjoy the summer algebra activities as you prepare to return to school for your first high school level course!

Sincerely,

Your 8th grade Algebra 1 Honors teachers

(Students who take Algebra 1 Honors in grade 8 will receive HS credit. Successful completion of Algebra 1 Honors will lead students into Geometry or Geometry Honors in HS).

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Name: _____

1. Simplify each expression.			
A. $w^9 \cdot w^3$	B. $x^{-5} \cdot x^7$	C. $7^8 \cdot 7^3 \cdot 7^{-2}$	D. $x^{-5} \cdot x^{-4} \cdot x$
E. $\frac{m^7}{m^4}$	F. $\frac{v^{-3}}{v}$	G. $\frac{3^6}{3^{-4}}$	H. $\frac{p^{-7}}{p^2}$
I. $(5^3)^7$	J. $(x^{-2})^6$	K. $(m^{-4})^{-10}$	L. $(19^9)^{-5}$
M. $\frac{m^6 \cdot m^4}{m^7}$	N. $\frac{x^3}{x^2 \cdot x^5}$	O. $\frac{c^5 \cdot c^{-1}}{c \cdot c^3}$	P. $\frac{v^8 \cdot v^{-2}}{v^4 \cdot v^3}$
2. Simplify the algebraic expressions.			
A. $7(m-3) + 4(m+5)$		B. $2m^2 - 5n^2 + 6n^2 - 8m$	
C. $10(n^2 + n) - 6(n^2 - 2)$		D. $y^2 + 2y + 3y^2$	

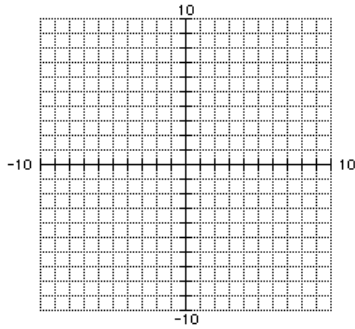
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3. Solve each equation.		
A. $6m - 3 = 21$	B. $3 = 2p + 5$	C. $1 = \frac{1}{3}a - 5$
D. $5b - 4 = 2b + 8$	E. $2c + 14 = 6 - 4c$	F. $3(x + 5) = 3x + 15$
G. $\frac{1}{2}x + 4 = \frac{-2}{3}x + \frac{1}{2}$	H. $-2(4 - 3x) + 7 = 6(x + 1)$	
I. $3(2x - 5) - x = -7(x + 3)$	J. $2(-x - 4) + 3 = -7x + 5 + 5x$	
4. Find the slope of the line that passes through the two points.		
A. (2,-4) (4,-1)	B. (-3,6) (-7,3)	C. (4,4) (4,9)

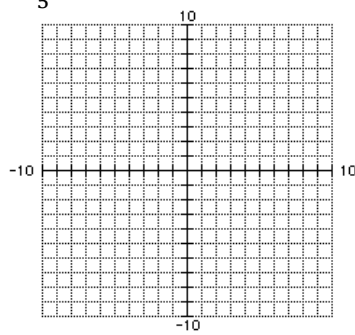
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5. Graph the equation.

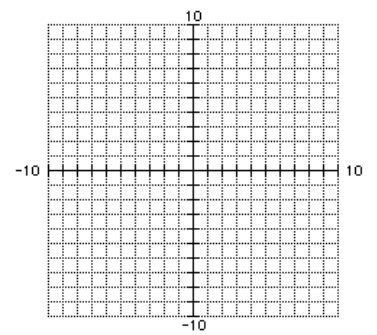
A. $y = -x + 2$



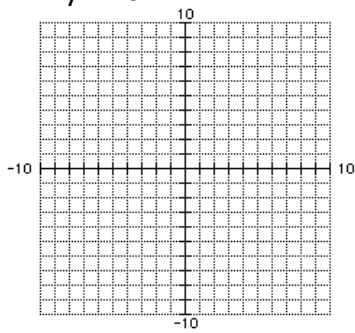
B. $y = \frac{2}{5}x + 4$



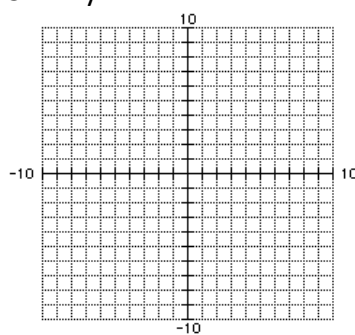
C. $y = 2$



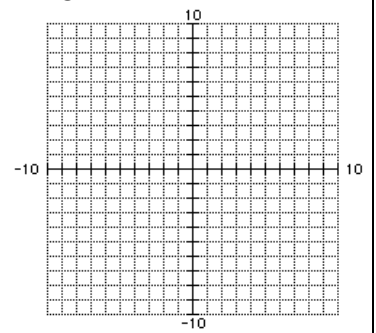
D. $5x + 2y = 10$



E. $3x - 2y = 12$

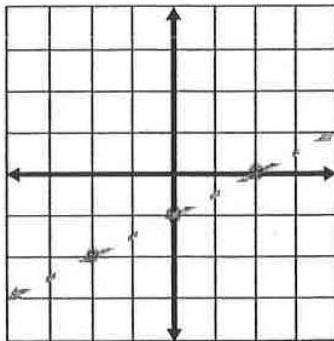


F. $x = -3$

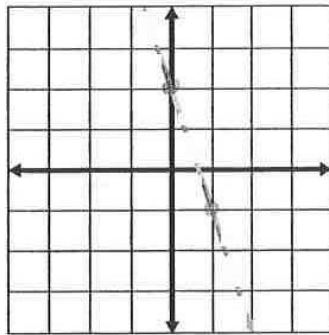


6. Write an equation in slope-intercept form to represent the line.

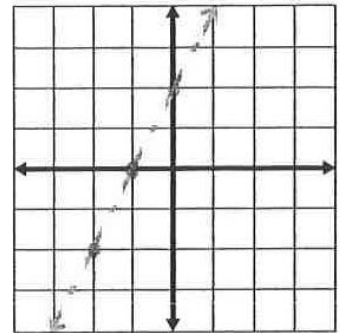
A.



B.



C.



7. Write the equation of a line in slope intercept form that passes through the two points.

A. $(-1,3)$ and $(2,9)$

B. $(4,-1)$ and $(6,-7)$

C. $(-5,-2)$ and $(-3,8)$

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8. Write and solve an equation for each word problem.

A. Elaine is 8 years younger than her brother Tyler. The sum of their ages is 34. Define a variable and then write and solve an equation to find Elaine's and Tyler's ages.

B. Last week, Donnell practiced the piano 3 hours longer than Marcus. Together, Marcus and Donnell practiced the piano for 11 hours. For how many hours did each young man practice the piano?

C. Olivia ordered 24 cupcakes and a layer cake. The layer cake cost \$16, and the total cost of the order was \$52. What was the price of each cupcake?

9. Find the prime factorization of each number.

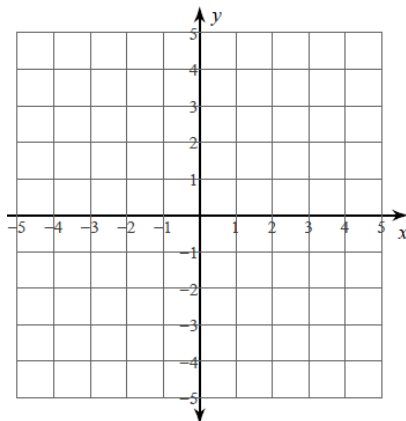
A. 120

B. 24

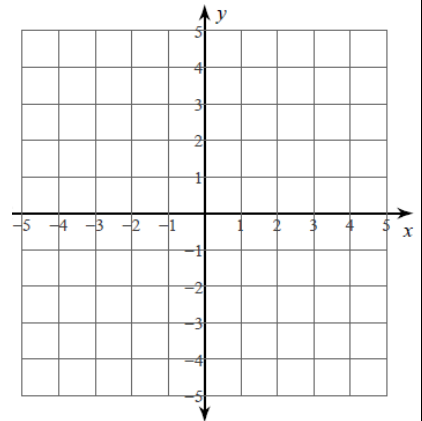
C. 72

10. Solve the following systems by graphing.

A. $y = \frac{1}{3}x - 3$
 $y = -x + 1$

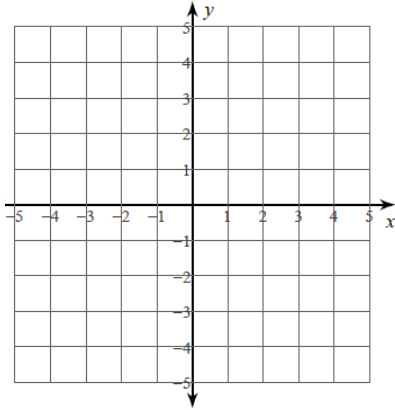


B. $y = \frac{5}{2}x + 4$
 $y = -1$

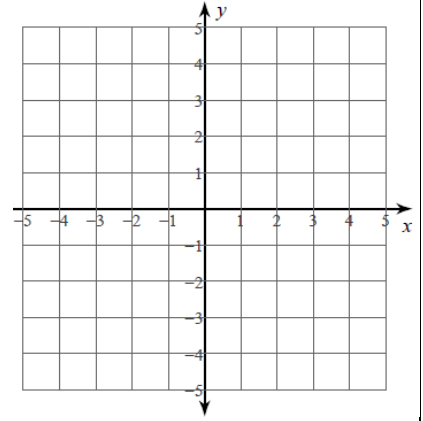


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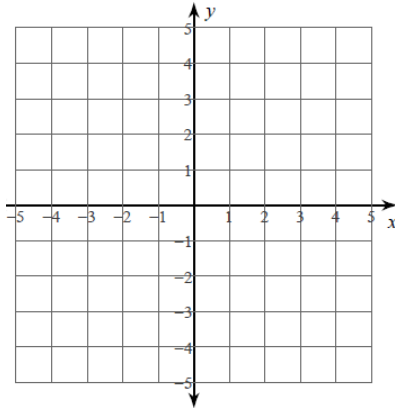
C. $y = -\frac{1}{2}x - 2$
 $y - 2 = -\frac{3}{2}x$



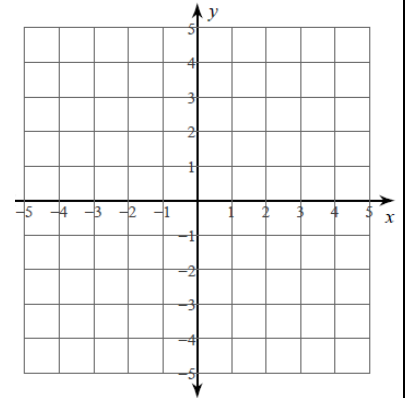
D. $y + \frac{1}{2}x = -1$
 $y = \frac{1}{4}x - 4$



E. $y - \frac{3}{4}x = 2$
 $y - 2 = \frac{3}{4}x$



F. $y + 4 = 3x$
 $y - 3 = -\frac{1}{2}x$



11. Solve the following systems using elimination.

A. $-4x - 2y = -12$
 $4x + 8y = -24$

B. $x - y = 11$
 $2x + y = 19$

C. $x + 3y = -6$
 $5x - 6y = -23$

D. $4x + 4y = 0$
 $-x - 2y = 4$

E. $-7x + y = -19$
 $-2x + 3y = -19$

F. $-3x + 7y = -16$
 $-9x + 5y = 16$

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12. Solve the following systems using substitution.

A. $x + 4y = 0$
 $-5x + 2y = 22$

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

C. $y = -2x + 1$
 $y = x + 4$

D. $-x - 7y = -3$
 $3x + 21y = -4$

E. $x + 4y = 9$
 $-5x + 7y = -18$

F. $4x - 4y = 4$
 $6x - 5y = -2$

13. Write and solve a system of equations for each situation. Use any method to solve the systems.

A. Your school sold 456 tickets for the high school play. An adult ticket costs \$3.50 and a student costs \$1.00. The total ticket sales was \$1131. How many adult tickets and how many student tickets did they sell? Set up a system to solve.

B. A landscaping company placed two orders with a nursery. The first order was for 13 bushes and 4 trees, and totaled \$487. The second order was for 6 bushes and 2 trees, and totaled \$232. The bill does not list the per-item price. What is the cost of one bush and of one tree?

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C. The treasurer of the student body at a college reported that the receipts from a recent concert totaled \$916. Furthermore, he announced that 560 people had attended the concert. Students were charged \$1.25 each for admission to the concert, and adults were charged \$2.25 each. How many adults attended the concert?

14. Circle the perfect squares in the following set of numbers.

24	100	9	16	50
81	35	49	121	44

15. Circle the perfect cubes in the following set of numbers.

27	9	24	8	125
33	64	99	216	6

16. Match each divisibility rule with its corresponding number.

A # is divisible by:

2
3
4
5
6
9
10

When:

The number ends in a 5 or 0.
The number is divisible by 2 & 3
The number ends in 0.
The number is even.
The sum of the digits is divisible by 3.
The sum of the digits is divisible by 9.
The last two digits are divisible by 4.

17. List what numbers each of the following numbers is divisible by.

A. 24: _____

B. 51: _____

C. 64: _____

D. 90: _____

E. 132: _____

F. 196: _____