

# Algebra Honors

## Summer Math Packet

The purpose of this summer work is to help prepare you for your upcoming Algebra 1 Honors math class. The work will tap into your prior knowledge and review past content, concepts and skills. Our expectation is that you arrive on the first day of school able to demonstrate mastery of the material in this packet. In order to achieve this, please allow yourself plenty of time to work on the problems. Use your resources such as Khan Academy, Math Nation or another math site of your choice. This work will be due by Friday, August 23rd, 2019, and collected by your math teacher. A bonus coupon of 10%, to be added onto any first quarter quiz or test grade, will be awarded to those students who complete the packet over the summer months and return it upon the specified due date. Completion of this review packet is required for all students taking Honors Algebra. If you choose not to complete the packet during the summer, you will still be required to complete it by Friday, August 30<sup>th</sup>, 2019, keeping in mind that you will also be responsible for completing your daily Algebra homework assigned by your teacher. Please be aware that there will be a diagnostic post-test administered to all Algebra Honors students on or around Friday, September 6th, 2019, that will assess your proficiency of the concepts covered in the summer packet.

All pages of the packet should be completed without the use of a calculator and with all work neatly shown. Each problem should not take you too long to answer as they are concepts that you should have mastered by the end of seventh grade.

Student Name: \_\_\_\_\_

2018-2019 math teacher: \_\_\_\_\_

**SP1**

Required: EVENS

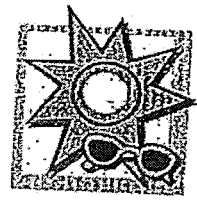
Optional: ALL

Name \_\_\_\_\_

# Pre-Algebra 7 Summer Review Packet

Simplify. Use order of operations.

- 1  $-5(-1 + 6)$
- 2  $\frac{8(-3)}{-6}$
- 3  $\frac{-380}{38} + \frac{380}{-38}$
- 4  $(2)(-2) + (5)(6)$
- 5  $\frac{-15}{15} + \frac{150}{15}$
- 6  $(-1)(-7)^2$
- 7  $(-3)(7)(-2)(5)$
- 8  $(-2)^4$
- 9  $(-3)(-12)(-1)$
- 10  $\frac{-60}{-3} + \frac{-48}{4}$
- 11  $-1(-6) + 8(-2)$
- 12  $(-9)^2(-1)^5$
- 13  $(-8)(-1)(4)(-3)$
- 14  $\frac{9(-4)}{-2}$
- 15  $\frac{-32}{2} + \frac{-75}{-15}$
- 16  $-7 + 8 + (-9) + 10$
- 17  $(-3)^2(-2)^3$
- 18  $\frac{-6 + (-3) + (-7)}{4}$
- 19  $-5 \cdot 2 \cdot 53$
- 20  $-8 + 17 + (-3)$
- 21  $\frac{-72}{8} + \frac{-56}{7}$
- 22  $(-3 \cdot 7) + (-2 \cdot 4)$
- 23  $\frac{170}{-10} + \frac{96}{12}$
- 24  $(-30)^2$
- 25  $(-7)(5)(-4)$
- 26  $\frac{-9 \cdot 5}{3}$
- 27  $(-2)(-3) + (-1)(7)$
- 28  $(-4)^3$
- 29  $\frac{(-4)(-25)}{5}$
- 30  $\frac{-19 + (-11)}{6}$
- 31  $80 + (-50) + (-70)$
- 32  $-2(-5)(-6)$



Required: EVENS  
Optional: ALL

Algebraic Expressions

SP2

Use the distributive property to write an equivalent expression.

25.  $5(5 + c)$  \_\_\_\_\_ 26.  $-8(y + 2)$  \_\_\_\_\_ 27.  $(m + 1)9$  \_\_\_\_\_  
28.  $-3(2a + 5)$  \_\_\_\_\_ 29.  $4(y + 3z)$  \_\_\_\_\_ 30.  $(2a + 3b)4$  \_\_\_\_\_

Factor and check by multiplying.

31.  $9y + 21$  \_\_\_\_\_ 32.  $14a + 35b$  \_\_\_\_\_ 33.  $3x + 21y + 12z$  \_\_\_\_\_  
34.  $7m + 42n$  \_\_\_\_\_ 35.  $10c + c$  \_\_\_\_\_ 36.  $9 + 21z$  \_\_\_\_\_  
37.  $8a + 6b + 10c$  \_\_\_\_\_ 38.  $10x + 25y + 30$  \_\_\_\_\_ 39.  $36 + 72s + 4t$  \_\_\_\_\_

Collect like terms.

40.  $17c + 6c$  \_\_\_\_\_ 41.  $3y + 7x + 5y$  \_\_\_\_\_  
42.  $3a^2 + 16 + 9a + 2a^2$  \_\_\_\_\_ 43.  $5m + 11n + 11m + 5n$  \_\_\_\_\_  
44.  $\frac{3}{5}z + \frac{2}{3}z + 4z + 9$  \_\_\_\_\_ 45.  $\frac{3}{10}y + 2y + 7y + \frac{7}{10}y$  \_\_\_\_\_

Write as an algebraic expression.

1. 7 less than 4 times a number  
-----  
3. 6 less than twice w  
-----  
5. 5 more than the product of 14 and y  
-----  
7. double the sum of x and 5  
-----
2. 11 more than half a number  
-----  
4. the sum of triple z and half of x  
-----  
6.  $1/2$  the difference of a number and 15  
-----  
8. 4 less than the quotient of x and -5  
-----

Translate to an equation and solve.

9. A number increased by 36 is 15. Find the number. \_\_\_\_\_  
10. A number decreased by 83 is 46. Find the number. \_\_\_\_\_  
11. Rico delivered 292 newspapers this week. This was 17 more than last week. How many newspapers did he deliver last week? \_\_\_\_\_  
12. Nancy bought a box of 12 brackets for \$11.52. What was the cost of a single bracket? \_\_\_\_\_  
13. Shauna bought a skirt on sale for \$28. That is 80% of the regular price. What is the regular price?  
-----  
-----

# Percent

Required: EVENS  
Optional: ALL

SP3

Write as a decimal.

1. 19% \_\_\_\_\_ 2. 130% \_\_\_\_\_ 3. 0.05% \_\_\_\_\_ 4. 1.65% \_\_\_\_\_ 5. 24% \_\_\_\_\_

Express as a percent.

6.  $\frac{3}{5}$  \_\_\_\_\_ 7.  $\frac{7}{10}$  \_\_\_\_\_ 8.  $\frac{10}{8}$  \_\_\_\_\_ 9.  $\frac{1}{20}$  \_\_\_\_\_ 10.  $\frac{3}{2}$  \_\_\_\_\_

Solve.

11. What percent of 65 is 40? \_\_\_\_\_ 12. What number is 8% of 250? \_\_\_\_\_  
13. What is 120% of 50? \_\_\_\_\_ 14. What percent of 50 is 112? \_\_\_\_\_

Find the absolute value.

15.  $|4|$  \_\_\_\_\_ 16.  $|-1.7|$  \_\_\_\_\_ 17.  $|0|$  \_\_\_\_\_ 18.  $|-8|$  \_\_\_\_\_  
19.  $|-5.2|$  \_\_\_\_\_ 20.  $|0.3|$  \_\_\_\_\_ 21.  $|-9.1|$  \_\_\_\_\_ 22.  $|-37|$  \_\_\_\_\_

## Extra Practice

Use a proportion or an equation to solve.

1. 60% of 185                      2. 5% of 80                      3. 4% of 55

Use a proportion or an equation to solve.

4. What percent of 90 is 27?                      5. 63 is what percent of 105?  
6. What percent of 160 is 120?                      7. 9 out of 36 is what percent?

Use a proportion or an equation to solve. Round to the nearest tenth.

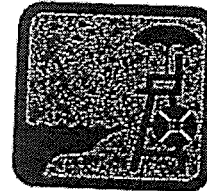
8. 14 is 7% of what number?                      9. 40% of what number is 35?  
10. 15% of what number is 45?                      11. 22 is 25% of what number?

Solve by writing an equation.

12. A pair of jeans costs 75% as much as a pair of corduroy pants. What is the cost of each if the total cost for the jeans and cords is \$42?  
13. When Juanita was on vacation it rained 35% of the days. She was on vacation for 20 days. How many days did it rain?

Find the discount and sale price for each.

14. Regular price = \$45  
Discount = 40%
15. Regular price = \$2,450  
Discount = 6%



# Simplifying and Evaluating

Required: EVENS  
Optional: ALL

**SP4**

Simplify.

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

2.)  $18 - (4x - 12) =$  \_\_\_\_\_

3.)  $5y + 3x - 13y + 5x =$  \_\_\_\_\_

4.)  $5(2x - 8) - 14 =$  \_\_\_\_\_

5.)  $6(4x - 9) + 5(3x + 11) =$  \_\_\_\_\_

6.)  $18a - (a - 12) + 7(2a - 1) =$  \_\_\_\_\_

7.)  $24 + 12(5x - 2) - 3(8x + 10) =$  \_\_\_\_\_

8.)  $2(6y - 4) - (4y + 8) + y =$  \_\_\_\_\_

9.)  $5a + 6(a + 3b - 4) - 10(4a - 2b) + 21 =$  \_\_\_\_\_

10.)  $9x + 3y - 4(x - 7) + 2(5y - 8) - (6x + 11y) =$  \_\_\_\_\_

Evaluate for the given values.

①  $\frac{xa}{c} =$

②  $\frac{2a^2}{x} =$

③  $\frac{(2a)^2}{x} =$

④  $\frac{(2a)^2}{2a^2} =$

⑤  $\frac{c^2y^2}{z} =$

⑥  $\frac{-8y^2}{b+z} =$

⑦  $\frac{x^2+c^2}{b} =$

⑧  $\frac{y^2-a^2}{y+a} =$

⑨  $\frac{-x^2}{z} =$

⑩  $\frac{-4a^2}{c+b} =$

VALUES OF THE VARIABLES	
$x=2$	$a=-3$
$y=-1$	$b=-8$
$z=4$	$c=6$

⑪  $\frac{(z+b)^2}{2b} =$

⑫  $\frac{3a^2+7a}{x} =$

Required: EVENS  
Optional: ALL

SP5

Solve each equation. Show all steps.

1.  $3x - 7 = x - 9$

2.  $10 - 8z = -z - 4$

3.  $2y + 7 = 5y - 8$

4.  $2(3x + 1) = 9x - 1$

5.  $2a + (5a - 13) = 47$

6.  $3(y + 7) = 2(y + 9)$

7.  $3(m - 5) + 1 = 2(m + 1) - 9$

8.  $\frac{2y - 12}{4} = -25$

9.  $19 - (2x + 3) = 2(x + 3) + x$

10.  $62 = \frac{a}{3} + 51$

11.  $5x - 2(x - 1) = 2(2x - 1)$

12.  $4r - 4(r - 4) + r = 37$

Solve by clearing fractions.

13.)  $9 - \frac{4}{5}[u - 3] = 1$

14.)  $\frac{4}{9}y - \frac{4}{3} = \frac{1}{6}y + \frac{11}{18}$

15.)  $1 - \frac{2}{3}y = \frac{9}{5} - \frac{y}{5} + \frac{3}{5}$

16.)  $\frac{2}{3} + 3y = 5y - \frac{2}{15}$

Solve by clearing decimals.

17.)  $0.13y - 4.1 = 0.3y - 1.7 - 0.41y$

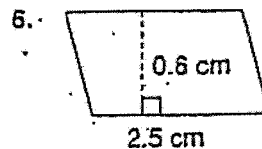
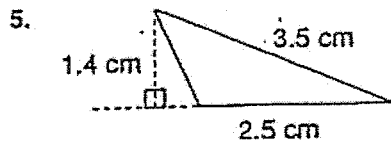
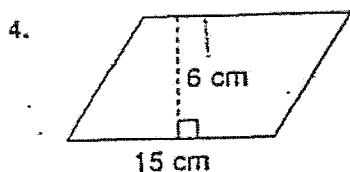
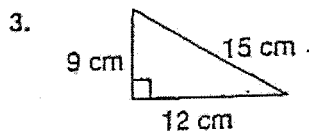
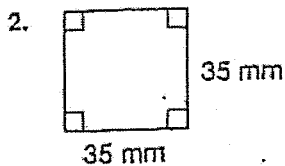
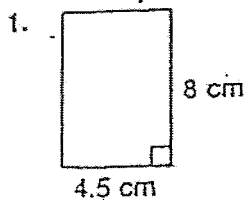
18.)  $0.7n - 15 + n = 1.2 + 1.5n - 9.2$

# Finding Area of Plane Figures

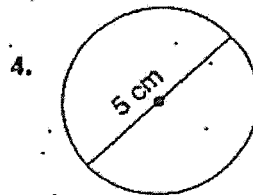
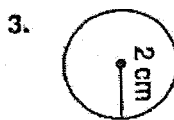
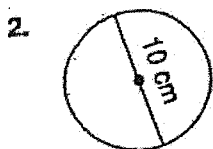
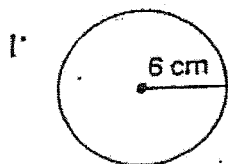
Required: EVENS  
optional: ALL

SP6

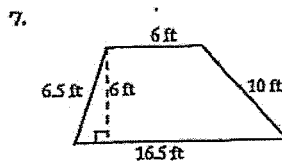
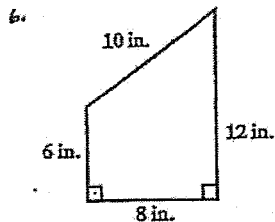
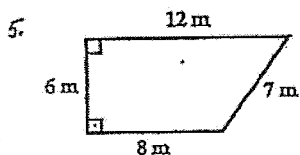
Find the area of each figure.



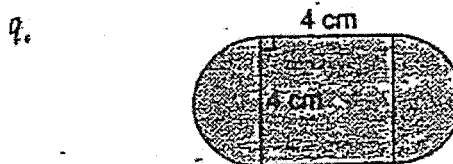
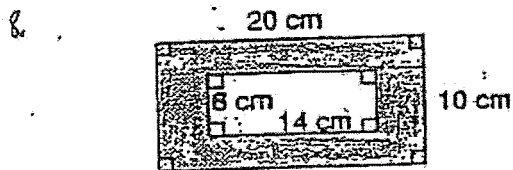
Find the circumference and the area of each circle.  
Choose mental math, paper and pencil, or a  
calculator. Use 3.14 for  $\pi$ . Round to the nearest hundredth.



Find the area of each trapezoid.



Find the area of each shaded region. Round to the nearest hundredth.



Required: EVENS  
Optional: ALL

## Rewriting Formulas

SP7

Write an expression for each of the following.

1. An adult's ticket costs \$1.75 more than a child's ticket. Write an expression for the total cost of three adults' tickets and five children's tickets.
- 

2. There are 114 more boys than girls in the sophomore class. Write an expression for the total number of sophomore students.
- 

3. The sum of three consecutive integers
- 

4. The sum of an integer and half of the next integer.
- 

Solve.

5. The sum of three consecutive integers is 84. What are the integers?
- 

6. The sum of three consecutive odd integers is 159. Find the integers.
- 

7. A 35-ft board is cut into three pieces. The second piece is twice as long as the first. The third is twice as long as the second. How long is each piece?
- 

\* Solve for the given variable.

8.  $A = 2bc$ , for  $b$  \_\_\_\_\_

9.  $A = 2bc$ , for  $c$  \_\_\_\_\_

10.  $R = \frac{s}{t}$ , for  $s$  \_\_\_\_\_

11.  $R = \frac{s}{t}$ , for  $t$  \_\_\_\_\_

12.  $W = 3y + 3z$ , for  $y$  \_\_\_\_\_

13.  $W = 3y + 3z$ , for  $z$  \_\_\_\_\_

14.)  $A = \pi r^2$ , for  $r^2$

15.)  $A = \pi r^2$ , for  $\pi$

16.)  $A = \frac{1}{2}bh$ , for  $b$

17.)  $A = \frac{1}{2}bh$ , for  $h$

18.)  $E = mc^2$ , for  $m$

19.)  $E = mc^2$ , for  $c^2$

20.)  $A = \frac{a+b+c}{3}$ , for  $b$

21.)  $A = \frac{a+b+c}{3}$ , for  $c$

22.)  $v = \frac{3k}{t}$ , for  $t$

23.)  $P = \frac{ab}{c}$ , for  $c$



Required: EVENTS  
optional: ALL

**SP8**

Classify each number as: Real, Rational, Irrational, Whole, Natural, Integer

1)  $-15$

2)  $11$

3)  $\sqrt{30}$

4)  $\frac{17}{3}$

5)  $6$

6)  $0$

7)  $-13$

8)  $3$

9)  $\frac{10}{11}$

10)  $14$

11)  $-13$

12)  $\pi$

13)  $\frac{475}{325}$

14)  $\sqrt{77}$

15)  $\frac{6}{7}$

16)  $\sqrt{0}$

17)  $-\sqrt{196}$

18)  $-1$

19)  $\frac{-16}{-2}$

20)  $\frac{135}{-3}$

## Inequalities

Required: EVENS  
optional: ALL

**SP9**

Solve.

1.)  $-3x < 18$

2.)  $5x \leq 7x + 6$

3.)  $5 - 2x \geq -16$

4.)  $24 > 7y - 11$

5.)  $2(3a - 5) > 2a + 6$

6.)  $-3(4y - 6) \leq 7 - y$

7.)  $10(x + 2) > -2(6 - 9x)$

8.)  $9x - 2x \geq 14 - 9(-x - 4)$

9.)  $2(8x - 6) - 7x < 12 + 5x$

## Scientific Notation.

Write using standard notation.

40.  $6.781 \times 10^5$  \_\_\_\_\_

41.  $2.001 \times 10^{-2}$  \_\_\_\_\_

42.  $7.61 \times 10^{-5}$  \_\_\_\_\_

43.  $3.114 \times 10^3$  \_\_\_\_\_

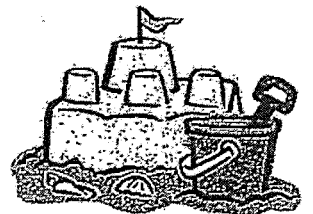
Write using scientific notation.

44. 6,821,000 \_\_\_\_\_

45. 0.810001 \_\_\_\_\_

46. 0.00000671 \_\_\_\_\_

47. 2631 \_\_\_\_\_



# Exponents

Required: EVENS  
optional: ALL

SP10

Simplify. Express using positive exponents.

1.  $5^{10} \cdot 5^2$  \_\_\_\_\_

2.  $t^0 \cdot t^5$  \_\_\_\_\_

3.  $4^2 \cdot 4^5 \cdot 4^7$  \_\_\_\_\_

4.  $n^7 \cdot n^3$  \_\_\_\_\_

5.  $a^3 \cdot a^3 \cdot a$  \_\_\_\_\_

6.  $(7x^2y^3)(xy)$  \_\_\_\_\_

7.  $\frac{x^{16}y^2}{x^3y}$  \_\_\_\_\_

8.  $\frac{(2x)^5}{(2x)^{12}}$  \_\_\_\_\_

9.  $\frac{(8x)^5}{(8x)^3}$  \_\_\_\_\_

Express using positive exponents.

10.  $6^{-3}$  \_\_\_\_\_

11.  $x^{-1}$  \_\_\_\_\_

12.  $3y^{-2}$  \_\_\_\_\_

13.  $m^{-4}$  \_\_\_\_\_

14.  $7y^{-1}$  \_\_\_\_\_

15.  $(5a)^{-1}$  \_\_\_\_\_

16.  $1^{-5}$  \_\_\_\_\_

17.  $x^0$  \_\_\_\_\_

18.  $6y^{-3}$  \_\_\_\_\_

Simplify.

19.  $(2t^4)^3$  \_\_\_\_\_

20.  $(-3x^2)^3$  \_\_\_\_\_

21.  $(a^5b^7c)^6$  \_\_\_\_\_

22.  $(3ab^2)^4$  \_\_\_\_\_

23.  $(-4a^3)^2$  \_\_\_\_\_

24.  $(7x^2y^3z)^2$  \_\_\_\_\_

25.  $\left(\frac{x^3}{y^2}\right)^2$  \_\_\_\_\_

26.  $\left(\frac{a^2}{2}\right)^4$  \_\_\_\_\_

27.  $\left(\frac{3}{5y^2}\right)^2$  \_\_\_\_\_

Multiply.

28.  $(3m^2)5$  \_\_\_\_\_

29.  $(16y^3)(-7)$  \_\_\_\_\_

30.  $(-3x^5)(x^2)$  \_\_\_\_\_

31.  $(-2a^2)(3a^9)$  \_\_\_\_\_

32.  $(x^2y^5)(xy^2)$  \_\_\_\_\_

33.  $(2a^2b)(5ab)$  \_\_\_\_\_

Divide.

34.  $\frac{x^{16}}{x^4}$  \_\_\_\_\_

35.  $\frac{t^2}{t^2}$  \_\_\_\_\_

36.  $\frac{5m^7}{m^4}$  \_\_\_\_\_

37.  $\frac{12x^5}{3x^3}$  \_\_\_\_\_

38.  $\frac{4a^3}{4}$  \_\_\_\_\_

39.  $\frac{25a^2b^3}{5a}$  \_\_\_\_\_

# Simplifying Expressions

Required: EVENS  
optional: ALL

SP11

## I. Combine like terms.

1.  $(4x^2 + 3x - 9) + (-9x + 10)$  \_\_\_\_\_

2.  $(9x^4 + 5x^2 - 2) + (3x^3 + 3)$  \_\_\_\_\_

3.  $(2x^4 + 5x^2 - 7x - 4) + (-7x^4 - 3x^2 + 7x + 5)$  \_\_\_\_\_

4.  $(14x^3 - 4x^2 - 3) + (9x^2 + 6x - 2)$  \_\_\_\_\_

5.  $(3x^2 - 6) - (x^2 + 1)$  \_\_\_\_\_

6.  $(5a^2 - 7a + 1) - (2a^2 + 3a - 6)$  \_\_\_\_\_

7.  $(3m^2n + mn - 5) - (2m^2n - m + 9)$  \_\_\_\_\_

8.  $(11x^2y + 6xy - y^2 + 6) - (4x^2 + 3y^2 - 9)$  \_\_\_\_\_

9.  $(4t^3 + 8t^2 - t + 21) - (3t^2 - 10t)$  \_\_\_\_\_

## II. Simplify. Write using positive exponents.

1.)  $y^{-4}$  \_\_\_\_\_

2.)  $5x^2y^{-2}$  \_\_\_\_\_

3.)  $(4a)^{-1}$  \_\_\_\_\_

4.)  $\frac{x^3 \cdot x^5}{x^7}$  \_\_\_\_\_

5.)  $c^2 \cdot c^{10} \cdot c^{-8}$  \_\_\_\_\_

6.)  $16a^{-3}b$  \_\_\_\_\_

## III. Evaluate.

1.)  $-\sqrt{25}$  \_\_\_\_\_

2.)  $\sqrt{39+10}$  \_\_\_\_\_

3.)  $\sqrt{72-8}$  \_\_\_\_\_

4.)  $\sqrt{4} + \sqrt{400}$  \_\_\_\_\_

5.)  $5\sqrt{100} + 2\sqrt{900}$  \_\_\_\_\_

6.)  $4\sqrt{81} - \sqrt{16+9}$  \_\_\_\_\_

7.)  $(\sqrt{9})^2$  \_\_\_\_\_

8.)  $(\sqrt{19})^2$  \_\_\_\_\_

9.)  $\sqrt{\frac{1}{9}}$  \_\_\_\_\_

10.)  $\sqrt{\frac{100}{121}}$  \_\_\_\_\_



Required: EVENS  
optional: ALL

Graphing on the Coordinate Plane

\*For the following points, tell the location on the coordinate plane.

QI = Quadrant 1; QII = Quadrant 2; QIII = Quadrant 3; QIV = Quadrant 4

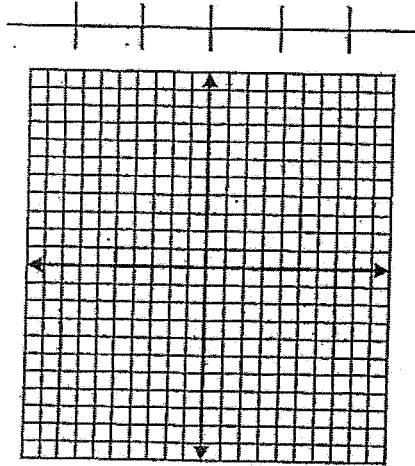
Other choices: Origin; X axis; Y axis

1) (2, -4) \_\_\_\_\_ 2) (0, 8) \_\_\_\_\_ 3) (6, 7) \_\_\_\_\_

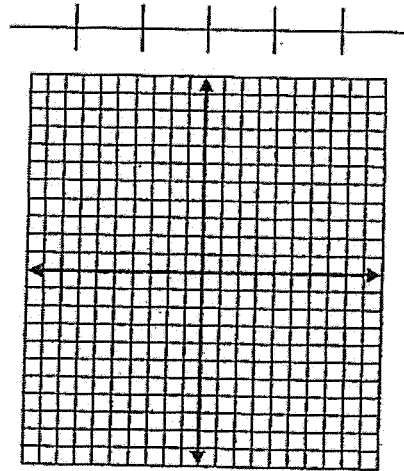
4) (-12, -3) \_\_\_\_\_ 5) (0, 0) \_\_\_\_\_ 6) (-5, 0) \_\_\_\_\_

\*Make a table of solutions for the following linear equations. Use -2, -1, 0, 1, 2 for x values. Then graph the solutions on the coordinate plane and create a line.

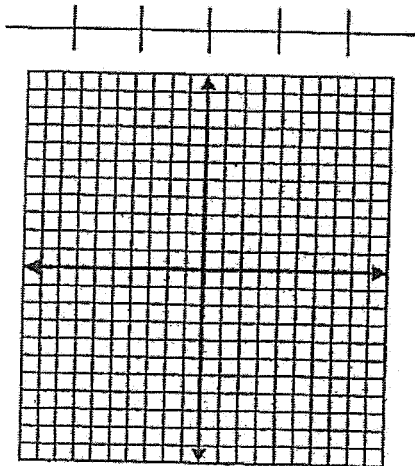
7)  $y = 3x$



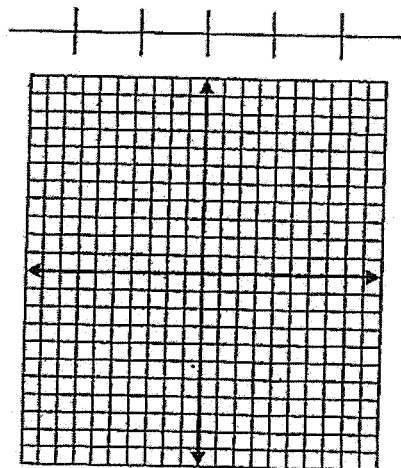
8)  $y = 2x + 5$



9)  $y = 5x - 1$



10)  $6x + 2y = -8$



Required : ALL

SP13

Perform the indicated operation. Leave answers in reduced form.

1.  $\frac{8}{9} \cdot \frac{15}{16} =$

2.  $\frac{6}{11} \div \frac{5}{12} =$

3.  $\frac{3}{8} + \frac{2}{5} =$

4.  $\frac{5}{6} - \frac{5}{8} =$

5.  $\frac{4}{5} \div \frac{8}{15} =$

6.  $\frac{1}{3} \cdot \frac{4}{15} =$

7.  $4\frac{5}{7} - 3\frac{1}{2} =$

8.  $4\frac{3}{8} - (-\frac{7}{10}) =$

9.  $\frac{4}{9} \cdot \frac{-3}{16} =$

10.  $-3\frac{5}{9} \div (-8) =$

11. Before soccer practice, your water bottle is  $\frac{7}{8}$  full. After practice it is  $\frac{2}{5}$  full. How much water did you drink during practice?

12. A carpenter used 24 boards each measuring  $3\frac{3}{4}$  inches long. How many feet long is the porch the carpenter built?