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 28th, 2020, 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 <u>return it upon the specified due date.</u> 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, September 4th,2020, 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 11th, 2020, that will assess your proficiency of the concepts covered in the summer packet.

<u>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.</u>

Student Name:_____

2019-2020 Math Teacher:_____

Required: EVENS
Optional: ALL

Name _____

Pre-Algebra 7
Summer Review Packet

Simplify. Use order of operations.

1. $-5(-1 + 6)$

2. $\dfrac{8(-3)}{-6}$

3. $\dfrac{-380}{38} + \dfrac{380}{-38}$

4. $(2)(-2) + (5)(6)$

5. $\dfrac{-15}{15} + \dfrac{150}{15}$

6. $(-1)(-7)^2$

7. $(-3)(7)(-2)(5)$

8. $(-2)^4$

9. $(-3)(-12)(-1)$

10. $\dfrac{-60}{-3} + \dfrac{-48}{4}$

11. $-1(-6) + 8(-2)$

12. $(-9)^2(-1)^5$

13. $(-8)(-1)(4)(-3)$

14. $\dfrac{9(-4)}{-2}$

15. $\dfrac{-32}{2} + \dfrac{-75}{-15}$

16. $-7 + 8 + (-9) + 10$

17. $(-3)^2(-2)^3$

18. $\dfrac{-6 + (-3) + (-7)}{4}$

19. $-5 \cdot 2 \cdot 53$

20. $-8 + 17 + (-3)$

21. $\dfrac{-72}{8} + \dfrac{-56}{7}$

22. $(-3 \cdot 7) + (-2 \cdot 4)$

23. $\dfrac{170}{-10} + \dfrac{96}{12}$

24. $(-30)^2$

25. $(-7)(5)(-4)$

26. $\dfrac{-9 \cdot 5}{3}$

27. $(-2)(-3) + (-1)(7)$

28. $(-4)^3$

29. $\dfrac{(-4)(-25)}{5}$

30. $\dfrac{-19 + (-11)}{6}$

31. $80 + (-50) + (-70)$

32. $-2(-5)(-6)$

Algebraic Expressions

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. $\frac{3}{5}z + \frac{2}{5}z + 4z + 9$ _____

45. $\frac{3}{10}y + 2y + 7y + \frac{7}{10}y$ _____

Write as an algebraic expression.

1. 7 less than 4 times a number

_____

2. 11 more than half a number

_____

3. 6 less than twice w

_____

4. the sum of triple z and half of x

_____

5. 5 more than the product of 14 and y

_____

6. 1/2 the difference of a number and 15

_____

7. double the sum of x and 5

_____

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

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 $\dfrac{xa}{c} = $

② $\dfrac{2a^2}{x} = $

③ $\dfrac{(2a)^2}{x} = $

④ $\dfrac{(2a)^2}{2a^2} = $

⑤ $\dfrac{c^2 y^2}{z} = $

⑥ $\dfrac{^-8y^2}{b+z} = $

⑦ $\dfrac{x^2 + c^2}{b} = $

⑧ $\dfrac{y^2 - a^2}{y + a} = $

⑨ $\dfrac{^-x^2}{z} = $

⑩ $\dfrac{^-4a^2}{c+b} = $

⑪ $\dfrac{(z+b)^2}{2b} = $

⑫ $\dfrac{3a^2 + 7a}{x} = $

VALUES OF THE VARIABLES

$x = 2$	$a = {}^-3$
$y = {}^-1$	$b = {}^-8$
$z = 4$	$c = 6$

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

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

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

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

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

Solve by clearing fractions.

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

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

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

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

Solve by clearing decimals.

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

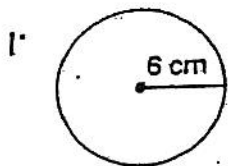18.) $0.7n - 15 + n = 1.2 + 1.5n - 9.2$

Finding Area of Plane Figures

Find the area of each figure.

1.

8 cm

4.5 cm

_____

2.

35 mm

35 mm

_____

3.

9 cm   15 cm

12 cm

_____

4.

6 cm

15 cm

_____

5.

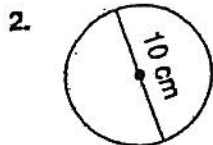1.4 cm   3.5 cm

2.5 cm

_____

6.

0.6 cm

2.5 cm

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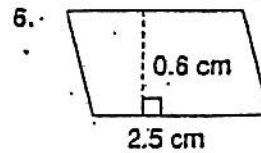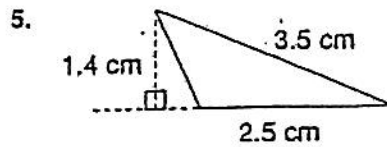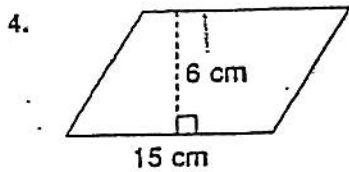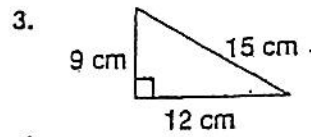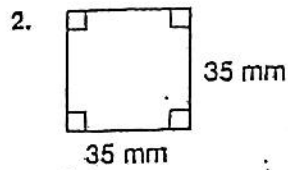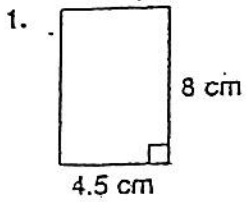
Find the circumference and the area of each circle.
Choose mental math, paper and pencil, or a
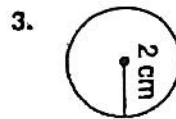calculator. Use 3.14 for π. Round to the nearest hundredth.

1.

6 cm

2.

10 cm

3.

2 cm

4.

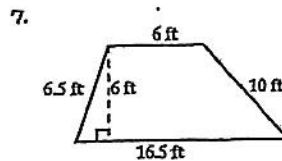5 cm

$C =$ _____

$A =$ _____

$C =$ _____

$A =$ _____

$C =$ _____

$A =$ _____
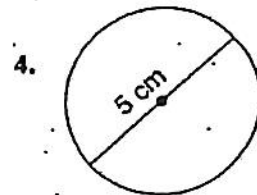
$C =$ _____

$A =$ _____

Find the area of each trapezoid.

5.

12 m

6 m   7 m

8 m

6.

10 in.

6 in.   12 in.

8 in.

7.

6 ft

6.5 ft 6 ft   10 ft

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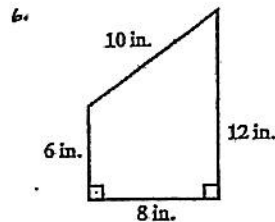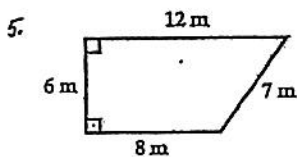
Find the area of each shaded region.   Round to the nearest hundredth.

8.

20 cm

6 cm   14 cm   10 cm

9.

4 cm

4 cm

_____

_____
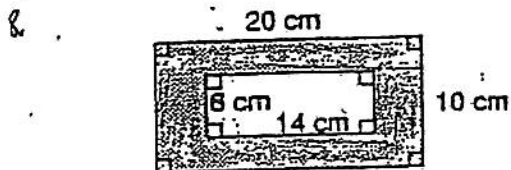
Rewriting Formulas

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 nest 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 π

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

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

1) -15

2) 11

3) $\sqrt{30}$

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

5) 6

6) 0

7) -13

8) 3

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

10) 14

11) -13

12) π

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

14) $\sqrt{77}$

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

16) $\sqrt{0}$

17) $-\sqrt{196}$

18) -1

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

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

Inequalities

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. 6.781×10^5 _____

41. 2.001×10^{-2} _____

42. 7.61×10^{-5} _____

43. 3.114×10^3 _____

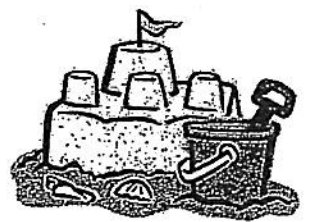Write using scientific notation.

44. $6,821,000$ _____

45. 0.810001 _____

46. 0.00000671 _____

47. 2631 _____

Exponents

SP10

Required: EVENS
optional: ALL

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. $\dfrac{x^{16}y^2}{x^3y}$ _____

8. $\dfrac{(2x)^5}{(2x)^{12}}$ _____

9. $\dfrac{(8x)^5}{(8x)^5}$ _____

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. $\left(\dfrac{x^3}{y^2}\right)^2$ _____

26. $\left(\dfrac{a^2}{2}\right)^4$ _____

27. $\left(\dfrac{3}{5y^2}\right)^2$ _____

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. $\dfrac{x^{16}}{x^4}$ _____

35. $\dfrac{t^2}{t^2}$ _____

36. $\dfrac{5m^7}{m^4}$ _____

37. $\dfrac{12x^5}{3x^3}$ _____

38. $\dfrac{4a^3}{4}$ _____

39. $\dfrac{25a^2b^3}{5a}$ _____

Simplifying Expressions

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.) $\dfrac{x^3 \cdot x^5}{x^7}$ _____

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

8.) $\left(\sqrt{19}\right)^2$ _____

9.) $\sqrt{\dfrac{1}{9}}$ _____

10.) $\sqrt{\dfrac{100}{121}}$ _____

Summer Vacation

Graphing on the Coordinate Plane

*For the following points, tell the location on the coordinate plane.
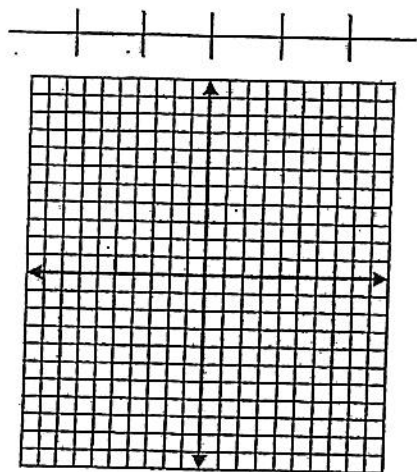QI = Quadrant 1; QII = Quadrant 2; QIII = Quadrant 3; QIV = Quadrant 4
Other choices: Origin; X axis; Y axis
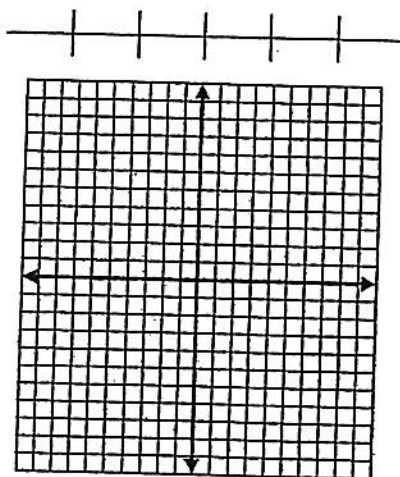
1) (2, -4) _____   2) (0, 8) _____   3) (6, 7) _____

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
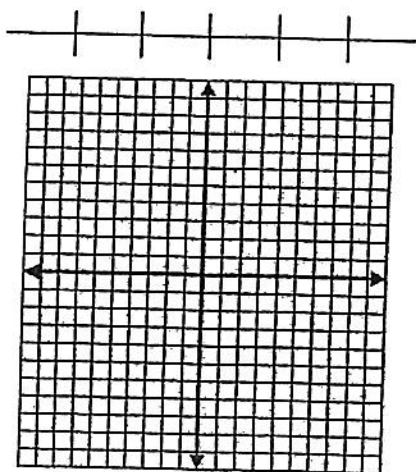x values. Then graph the solutions on the coordinate plane and create a line.
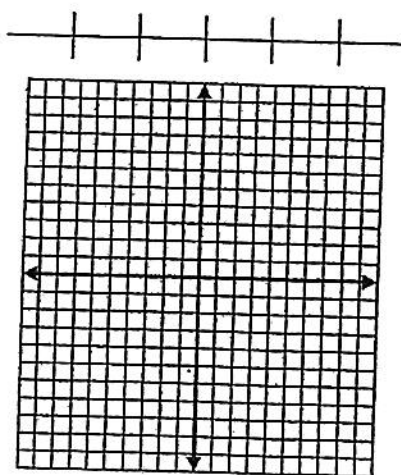
7) $y = 3x$

8) $y = 2x + 5$

9) $y = 5x - 1$

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

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

.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?