Welcome

Algebra 2 Honors is an honors level math course which is designed for those students who show aptitude for, interest in, and commitment to the study of mathematics. This course will not only include but also exceed the required Algebra 2 TEKS in content, depth, and complexity. As you consider your academic commitments as well as your extra-curricular interests for the next school year, it is imperative to consider the following before approaching this course.

- The pace of the course is faster than the level course.
- It is assumed that students will have mastered the material from previous math courses.
- Review of previous concepts will be minimal in the honors course.
- Students can expect 30-60 minutes of homework daily.
- Assessments are rigorous and require students to combine, apply and stretch concepts.
- Grades are based on mastery of the material. No extra credit assignments offered, nor bonus questions included.

Distractions

Cell Phones and Smart Watches pose an increased distraction to students. It is advised to consider changing the settings for notifications to off so that there are fewer interruptions during class.

Successful Honors Math Students

- ❖ Have near perfect attendance.
- ❖ Are not easily distracted by their cell phone or smart watch during class.
- ❖ Have exceptionally high rates of accuracy and timely completion of daily assignments.
- ❖ Have exceptional organization and time management skills.
- ❖ Are able to work independently and advocate for themselves when requiring help.

Pre-requisite Concept Mastery

It is assumed that by registering for Algebra 2 Honors students have mastered the following Algebra 1 & Geometry concepts. These concepts will not be reviewed to the extent that they would be in a level Algebra 2 course.

- ➢ Order of Operations
- ➢ Memorized math facts (multiplication tables and powers.)
- ➢ Operations with fractions
- ➢ Simplifying radicals
- ➢ Rationalizing Radicals
- ➢ Exponent Laws
- ➢ Graphing points, lines, and planes
- ➢ Writing equations of lines
- ➢ Solving systems of linear equations.
- ➢ Solving linear equations.
- ➢ Factoring
- ➢ Multiplying binomials
- ➢ Graphing and solving basic inequalities.
- ➢ Applying mathematical principals in application problems.

Summer Packet

The attached summer packet covers some of the topics listed above and is designed to offer practice to prepare students for Algebra 2 Honors for next school year. The packet is required and will be due the day of the first Unit Test. There will be some time for questions should any arise over the summer months. Our first unit will be a review unit and will cover and test over some of these same concepts.

ALGEBRA 2 HONORS SUMMER REVIEW PACKET

This summer packet covers some of the topics listed in the cover letter and is designed to offer practice to prepare students for Algebra 2 Honors for next school year. The packet is required and **is due the day of the first Unit Test.** Show work on ALL problems (use of Photomath is not a substitute for work.) **Box or circle your final answers**. All the problems can and **should be completed WITHOUT the aid of a calculator unless specifically stated.** Follow directions for each section and use notebook or graph paper to work through the problems. Be sure to number your work and **please put your answers ON the worksheet and staple the extra paper to this packet.**

Simplify each expression using order of operations.

1) $4^2 * 2 + [7 - (3^2 - 5)]$

2) $3^4 - 3^2 \div 3^2 - 3$

3) $\dfrac{2^5 \div 8 + 3}{4 + 3}$

Simplify each algebraic expression.

4) $5(x + y) - 4(3x - 2y + 1)$

5) $7[2 - 3(d - 4) + 4(d - 6)]$

6) $x^2 + y^2 - [x(x + y) - y(y - x)]$

7) $\dfrac{4a-7}{12} + \dfrac{a+1}{9} - \dfrac{a+2}{6}$

Evaluate each equation.

8) $-2x^2 + 3x$ when $x = -3$

9) $\dfrac{-2(y+1)}{16-2y^2}$ when $y = 4$

10) $(x^2 - y) \div 6$ when $x = 5, y = 1$

11) $p - (9 - (m + q))$ when $m = 4, p = 5$ and $q = 3$

Solve the following equations.

12) $7n - 6 = 9n - 14$

13) $-2n + 9n - 343 = 0$

14) $5a - 1 - 3(a + 7) = 2(a - 6)$

15) $|4x - 3| = 6$

16) $7.6r - 0.2 = 5.2r + 1$

17) $\dfrac{|3+r|}{7} \leq 5$

18) $4 + 6(2x - 3) \leq (1 - 3x)2 + x$

19) $2x + \dfrac{2}{3}(4 - x) = \dfrac{1}{6}(4x + 5) + \dfrac{9}{2}$

Simplify each expression. Your answers should contain only positive exponents.

20) $(3x^2)(4x^3)$

21) $\dfrac{m^4}{3m^5}$

22) $5(y^3)^0$

23) $(5x^{-2}y^3)^2$

24) $(4a^3b)(6b - 7ab^3)$

25) $\dfrac{x^2y}{3y^3x^3} \times \dfrac{18x^4}{xy^6}$

Simplify each radical expression. Give each answer in exact form (no decimals).

26) $\sqrt{81}$

27) $\sqrt{25v^3}$

28) $\sqrt{32c^2d^5}$

29) $3\sqrt{4x^3y^3}$

Perform the indicated operation. No calculator allowed. Leave in radical form.

30) $-2\sqrt{3} - 3\sqrt{27}$

31) $3\sqrt{18} + 2\sqrt{2}$

32) $\sqrt{20x^2} * \sqrt{20x}$

33) $-3\sqrt{3}(2 - \sqrt{6})$

34) $\dfrac{\sqrt{18x^3}}{\sqrt{2y}}$

Multiply the following polynomials

35) $(2x + 3)(x - 4)$

36) $(3x - 5)(3x + 5)$

37) $(y - 5)(2y^2 + 4y - 3)$

Factor the following polynomials

38) $n^2 + 6n + 8$

39) $p^2 - 13p + 40$

40) $2x^2 - 6x - 108$

41) $2v^2 + 3v - 9$

42) $3x^2 - 8x + 5$

43) $5t^2 + 19t + 12$

Solve for the specified variable.

44) Solve for h

$$A = \dfrac{h(b_1 + b_2)}{2}$$

45) Solve for h

$$V = \dfrac{1}{3}hs^2$$

46) Solve for F

$$C = \dfrac{5}{9}(F - 32)$$

Solve for the specified variable. (Continued)

47) Solve for L

$$L = \frac{2(L+W)}{P}$$

48) Solve for h

$$L = \frac{2\pi r(r+h)}{A}$$

Solve by factoring.

49) $n^2 - 10n + 24 = 0$

50) $x^2 - 11x + 19 = -5$

51) $6t^2 - 18t - 18 = 6$

52) $5r^2 - 44r + 120 = -30 + 11r$

53) $10x^2 - 6 = 7x$

Solve using the quadratic formula. Give answers in exact form (use $\sqrt{x}$ rather than a decimal!)

54) $-2x^2 + 8x + 2 = 0$

55) $2x^2 - 8x = -5$

56) $3x^2 + 1 = 5x$

Solve the system of equations using substitution.

57) $\begin{cases} 3x + y = 5 \\ 5x - 4y = -3 \end{cases}$

58) $\begin{cases} -3x - 3y = 3 \\ 5x + y = -17 \end{cases}$

59) $\begin{cases} 2x + y = 20 \\ 6x - 5y = 12 \end{cases}$

Solve the system of equations using elimination.

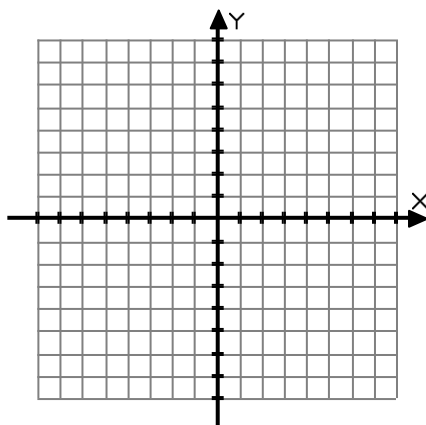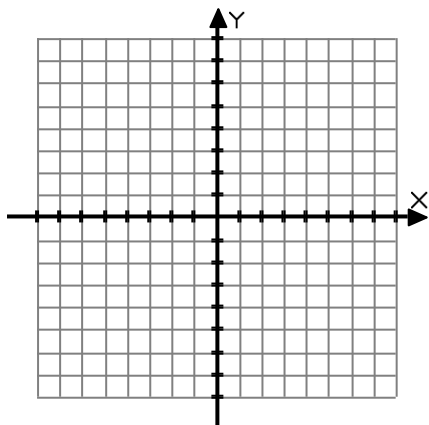60) $\begin{cases} 8x + y = -16 \\ -3x + y = -5 \end{cases}$

61) $\begin{cases} 7x + 2y = 24 \\ 8x + 2y = 30 \end{cases}$

62) $\begin{cases} 5x + 4y = -30 \\ 3x - 9y = -18 \end{cases}$

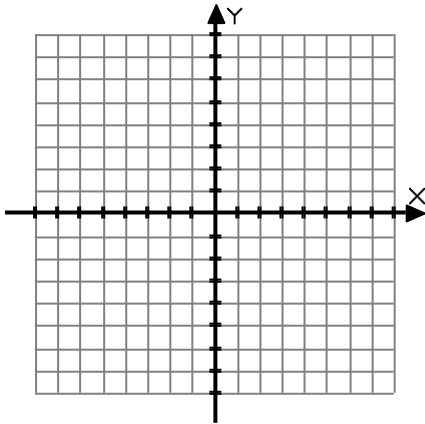**Graph the following linear and quadratic equations.**

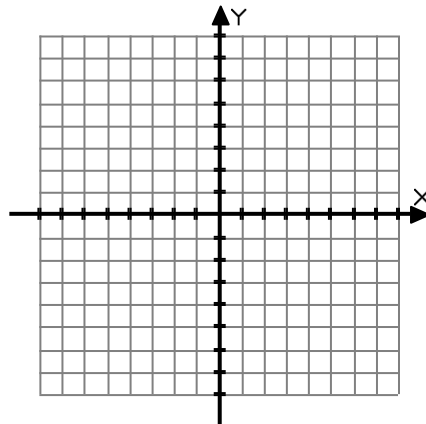63) $y = -\frac{6}{5}x + 1$

64) $10x - 3y = 15$

Graphing continued.

65) $x = -3$; $y = 5$

66) $y = -2x^2 + 4$

Write the equation in **Slope Intercept Form** for the line through the given points.

67) $(-5,1)(7,-1)$

68) $(-4,5)(-6,1)$

69) $(-4,-3)(4,0)$

Write the equation in Standard Form (Ax+By=C).

70) $y = \frac{2}{3}x + 4$

71) $y = 5 + \frac{1}{5}x$

72) $y = -\frac{2}{3}x + \frac{3}{5}$

Write the Point Slope Form $(y - y_1) = m(x - x_1)$ **of the equation for the line described.**

73) through $(1, -2)$ with a slope of -5

74) through $(-4, 5)$ with an undefined slope.

Write the Standard Form of the equation for the line described.

75) through $(-2,3)$, perpendicular to $y = -\frac{2}{3}x + 2$

76) through $(1,2)$, parallel to $y = 3x - 2$

Evaluate each expression. Write your answer in simplest form (ie – reduce!) Where applicable, leave answers as improper fractions. Show all work. Reminder, calculator should NOT be used.

77) $\frac{2}{3}(\frac{5}{6} - \frac{3}{4} + \frac{2}{3})$

78) $\dfrac{\frac{3}{9} - \frac{8}{12}}{\frac{3}{8} * 2}$

79) $-\frac{4}{9} * \frac{3}{2} - \frac{5}{6} + 3$

80) $(4 - \frac{5}{6} + 3 \cdot 2) \div \frac{5}{6}$

81) $\dfrac{\frac{2}{3} + 4}{\frac{5}{6}}$

82) $\dfrac{\frac{3}{2} + \frac{3}{4} + \frac{3}{8}}{21}$

Applications. Calculator can be used for the following problems.

83) Find the value of two numbers if their difference is 7 and their sum is 31.

84) A gym membership at Giant's gym costs $10.00 every month plus a one-time membership fee of $15.00. A gym membership at Strong's gym costs $4.00 a month plus a one-time membership fee of $40.00. After about how many months will the gym memberships cost the same amount? If planning to remain a member for at least a year, which is the better gym to join?

85) A transport plane was flying in food for a relief mission. It took one hour less time to get to their destination than it did to return to base. The average speed to their destination was 220 mph. The average speed on the way back was 200 ph. How many hours did the trip to their destination take?

86) Joe and Sofi were preparing food for their Super Bowl party at their restaurant. They planned to mix the two different bags of nuts they had on hand. The 9 lb. bag of mixed nuts which contained 55% peanuts were mixed with the 6 lb. bag that contained 40% peanuts. What percent of the combination is peanuts?

87) How many mg of a metal containing 45% nickel must be combined with 6mg of pure nickel to form an alloy containing 78% nickel?

88) From 1990 through 2000, the prize money, P (in $1,000s) for the US Bowling Championship can be modeled by the equation; $P = 30.2\,t + 35.8$ where $t = 0$ represents 1990. According to this model, when will the prize money equal half a million dollars?

89) The High School is selling theater tickets for their musical performance. During the first day of the pre-sale, the school sold 3 student tickets and 1 adult ticket for a total of $38.00. The school sold $52.00 worth of tickets on the second day of the pre-sale when they sold 3 student tickets and 2 adult tickets. Find the price of a student ticket and the price of an adult ticket.

90) Thanksgiving break started on a Tuesday after school. Jason left school and traveled toward a friend's house at an average speed of 40 mph. Jason's roommate, Matt, left one hour later and traveled to his parent's house in the opposite direction with an average speed of 50 mph. Find the number of hours Matt would have traveled before they found themselves 400 miles apart.