Welcome to Algebra II Honors at
Morton High School!

Dear Parents and Students,
Mathematics is a discipline that constantly builds on previous knowledge. Students entering Algebra II Honors will be expected to recall and apply the material that they learned in Algebra I and Geometry. To help ensure your success, the high school mathematics department has compiled a list of problems that represent some of the most frequently used Algebra concepts. Please take some time this summer to go over these problems. We have even included the solutions for you! When you return to school in the fall, be prepared to ask questions on any problems that have you stumped. There will be a test over this prerequisite material in the first few days of class to help determine your placement and readiness for Algebra II Honors.

Algebra II Honors Review Test is scheduled for Friday, August 17, 2018. Your performance on this test will be a significant factor in determining if you maintain your placement in honors. Class time will be provided on Thursday, August 16th for questions.

The packet can be accessed through the district website. To find the review, go to the Morton High School website at **http://mhs.morton709.org/my-class/math**
You will find a listing of all of our classes.
Please select Algebra II Honors Summer Review.

If you have any questions, contact Mrs. Durand at rosie.durand@mcusd709.org.

Have a wonderful summer!
The Mathematics Department
Morton High School

Note: For those students who will be purchasing a graphing calculator:
Please read the attached letter regarding graphing calculator requirements for MHS mathematics courses. You may send your student to school with the calculator's packaging intact for the math teacher to verify the correct calculator was purchased. CAS versions of the TI-Nspire are NOT allowed for students enrolled in Algebra 2.

FOR STUDENTS NEEDING TO PURCHASE A CALCULATOR:
MORTON HIGH SCHOOL Required Calculator: TI-Nspire CX

At Morton High School, all students use graphing calculators extensively in their math classes, whether they are in Algebra I through AP Calculus. This requirement has existed for a couple of years now; students are making great strides in mathematical understanding and performance as we continue to implement the use of the TI-Nspire CX. It is of critical importance that students obtain a calculator from the approved list because MHS math teachers have demonstration software for these specific devices, and it reduces the amount of class time spent on teaching students how to use the calculator.

In past years, Texas Instruments has offered schools a special opportunity to collect proof of purchase cards from students to be used towards a free TI-Nspire Navigator system or other TI-Nspire products. This system would allow us to wirelessly network graphing calculators to the teacher's computer, giving us the ability to let students demonstrate what they are doing to the class, receive document files from their teacher on their Nspire, and even use their calculator as a way to answer questions the teacher has posed to the class.

If you will be purchasing a new TI-Nspire CX (the latest version of the Nspire, which has a color screen) between now and the start of the 2018-19 school year, would you please return the entire "compare models" card that comes with the calculator to your child's math teacher? It will help us to obtain the Navigator system at no cost to the district. There is a picture of this card included on the next page. You must return the entire card, not just the "TI Points." **Do NOT purchase a calculator with CAS as part of its name.**

If your child will be using a hand me down TI-Nspire from an older sibling, such as the greyscale model, we will no longer be able to install the latest operating system nor will we be able to use this calculator with the Navigator system. It does, however, have most all of the functionality of the CX and can still be used with much success.

DO **NOT** PURCHASE THE TI-NSPIRE **CAS** OR TI-NSPIRE CX-**CAS**. Although the CAS is allowed on the SAT, these calculators are not allowed on the ACT and thus not allowed for students enrolled in MHS courses other than AP Calculus.

Thanks for helping us make sure your child receives the best possible math education with the latest tools available.

If the purchase of a graphing calculator will place an undue financial burden on your family, please contact your counselor or your math teacher.

Be sure to save the <u>entire card</u> with the TI Technology points and turn it in to any math teacher! With enough collected, the department will be able to earn software for use with your students!

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†Learn more at education.ti.com/research.

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**The TI-Nspire CX CAS handheld is not permitted on the ACT or IB exams.

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» **Claimants must send in the bottom half of the back of the retail package card for each of the 60 packages Tech Rewards Points (TRP) labels, as in this example:**

COMPARE MODELS	TI-84 Plus	TI-84 Plus Silver Edition	TI-Nspire with Touchpad	TI-Nspire CX	TI-89 Titanium
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Available Memory (ROM / RAM)	480 KB / 24 KB	1.5 MB/24 KB	15MB	100 MB Included	2.7 MB/188 KB
Rechargeable Battery			Optional		
Removeable Faceplates Available		■			
Computer Algebra System (CAS)					■
Engineering Applications					■
Interchangeable TI-84 Plus Keypad Available			■		
USB Cable Included	■	■	■	■	■
Software Included			■	■	
Import Images**			■	■	
Save your work			■	■	■
Color, Backlit Display				■	

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QUESTIONS?
education.ti.com/support
or 1-800-TI CARES

Manufactured for Texas Instruments, Dallas, TX

TI-Nspire™ CX

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Algebra 2/Trigonometry Honors Summer Review Packet

1. Graph the following numbers on a number line: $4, -2\frac{2}{3}, 0, -1, 2.5$

2. Use symbols to write the following statement: "Negative two is less than negative one half."
    Tell whether the statement is true or false.

3. $-3 < -5$ 4. $1 > -2$ 5. $|-4| = 4$ 6. $-|7| = -7$

Simplify.

7. $3[5(6-2) - 4^2]$ 8. $\dfrac{9 + 3 \bullet 5}{18 \div 6 + 3}$ 9. $-6 + 13 + (-5)$

10. $-11 + (-8) + 9$ 11. $7 + (-4) - (-5)$ 12. $-3.2 - (4.6 - 5)$

13. $-3(2-7) + 4(-6)$ 14. $(-6c)(4d)(-\dfrac{1}{8})$ 15. $24 \div (-6) \div (-2)$

16. $\dfrac{4(-8) - 3(-4)}{(-5)(-2)}$ 17. $\dfrac{-6x^2 + 10x - 2}{-2}$

Evaluate each expression if $r = 5$, $s = 3$, and $t = 1$, $x = -3$, $y = -1$

18. $r^2 + 2s - rst$ 19. $\dfrac{2s^2 + 3(r - t)}{r + s + 2t}$ 20. $2x^2 - 5x - 8$

21. $\dfrac{y + 9}{(y - 1)(3 - y)}$

Solve.

22. $2k - 1 = k - 5 + 3k$ 23. $-(5 - x) = x + 3$ 24. $1.5(u + 2) = 7.5$

25. $0.2(x - 5) = x + 5$ 26. $3(x - 2) - x = 2(2x + 1)$ 27. $2z - (1 - z) = 11 - z$

28. $2(5t - 3) - t = 3(3t - 2)$ 29. $\dfrac{6x - 2(x - 4)}{3} = 8$

Solve the equation for the given variable.

30. $2x - 5y = 10 \; for \, x$ 31. $S = -\dfrac{1}{2}gt^2 + vt \; for \, v$

Express each answer in simplest form in terms of the given variable.

32. A rectangular garden that is w ft wide is enclosed by 120 ft of fencing. How long is the garden?

33. The perimeter of an isosceles triangle is 300 cm, and its base is b cm long. How long is each leg?

34. In a basketball game, one team's score is two points less than half the other team's score, which is x. What is the difference in the scores?

35. The length and the width of a rectangle are consecutive even integers, and the length is x cm. Find (a) the area and (b) the perimeter of the rectangle. (Note: Consider the length to be longer than the width).

36. Two jets leave an airport at noon, one flying north at r mi/h, and the other flying south at twice that speed. After 3 h, how far apart are the planes?

37. Jessica's bank contains 18 quarters and dimes, of which q are quarters. Find the total value of the coins in dollars.

Solve.

38. Amy has $8 less than Maria. Together they have $30. How much money does each girl have?

39. A music dealer ran a sale of records and tapes. Records were reduced to $7 each and tapes to $7.50 each. The dealer sold 60 more records than tapes for a total sale of $2160. How many records did the dealer sell?

40. The perimeter of a certain basketball court is 266 ft, and its length is 35 ft more than its width. Find the dimensions of the court.

41. The measure of a supplement of an angle is 12 degrees greater than three times the measure of a complement. Find the measure of the angle.

42. At 10:30 A.M. two planes leave Houston, one flying east at 560 km/h and the other flying west at 640 km/h. At what time will they be 2100 km apart?

43. A jar contains 40 coins consisting of dimes and quarters and having a total value of $4.90. How many of each kind of coin are there?

44. At noon a train leaves Bridgton heading east at 90 mi/h to Cogsville, 450 mi away. At 12:15 P.M. a train leaves Cogsville heading west to Bridgton at 100 mi/h. At what time will they pass each other?

Solve.

45. $3x - 8 = 7$ 46. $4(1 - x) = 2(x - 4)$

47. Solve the formula $m = \dfrac{1}{2}(a + b) \; for \, b$

48. Using n for the variable, translate this word phrase into an algebraic expression: Twice the sum of a number and its square.

49. Express your answer in terms of x: What is the perimeter of a rectangle that is x cm wide and 5 cm longer than it is wide?

50. Two cars, heading toward each other on a divided highway, are 250 mi apart. If one car travels 45 mi/h and the other 10 mi/h faster, in how many hours will the cars pass each other?

51. On a number line, the coordinate of point A is -3, and the coordinate of point B is 7. Find the coordinate of the point halfway between A and B.

Simplify.

52. $|-5| - |5|$

53. $\dfrac{2 \bullet 5^2 + 1}{2 \bullet 3^2 - 1}$

54. $\dfrac{1}{2}(2a + 1)$

55. $(-14 + 8) - (4 - 11)$

56. $8m - 6n - m + 2n$

57. $3(2x - y) - 4(x - 2y)$

58. $(-a)^2 + a^2$ 59. $6(3-7) \div (-2)^3 \div (-1)$ 60. $\dfrac{24 - 20x}{-4}$

61. Evaluate $x(y-1)^2$ if $x = 4$ and $y = 3$.

Solve.

62. $2(3-x) = 3x + 1$ 63. Solve $A = 2\pi(r + h)$ *for* h

64. The hourly wages of three workers are consecutive even integers. If the highest-paid worker's hourly wage is x, what is the sum of all three workers' hourly wages?

65. The perimeter of a rectangle is 24 cm. If the length is y cm, what is the width?

66. The school book store sold 8 more pencils than pens one day. The cost of a pencil is $.05, and the cost of a pen is $.20. If the day's sales of pens and pencils totaled $8.90, how many pencils were sold?

67. A woman drove part of a 185 mile trip at 50 mi/h and the rest at 55 mi/h. Find the distance she traveled at 50 mi/h if her total driving time was 3 h and 30 min.

68. On a number line, point A has coordinate -4, and point B has coordinate 5 the coordinate of the point two thirds of the way from A to B.

69. List 0.6, -0.8, 1.4, -1, and -0.2 in order from least to greatest.

Simplify

70. $5 \bullet 3^2 - 2(4 + 6)$ 71. $|8 - 13| - |-7 - (-3) + 1|$ 72. $8m - 4 - 9m + 7$

73. $-(-1)^3(-2)^2$ 74. $5(3x - 2y) - 4(6y - x)$ 75. $\left|\dfrac{(-6)^2 - 3(-4)}{-8 + 2}\right|$

76. $\dfrac{9 - 12x^2}{-3}$

Evaluate if $x = 2$, $y = 4$, and $p = -3$

77. $\dfrac{(x+y)^2}{x^2 + y^2}$ 78. $p(4 - p)(p + 1)$ 79. $7 - 2p - p^2$

Solve.

80. $\dfrac{3}{2}x - 7 = 2x + 3$ 81. $6(5x - 4) = 7(4x + 5) - 19$

82. Express your answer in terms of the given variable. A car's gas tank held x gallons of gas before a trip. The trip consumed three quarters of the gas in the tank, but 10 gallons of gas were added after the trip. How much gas is now in the tank?

83. Solve. A man invested $6000, part of it at 5% simple interest and the rest at 7% simple interest. If his annual interest income is $372, how much did he invest at each rate?

Solve.

84. $1 - 3x \leq -14 + 2x$

85. $8(t - 1) > -8 + 8t$

86. $3(q + 1) < 3q + 7$

87. $-6 \leq 2t - 5 \leq -3$
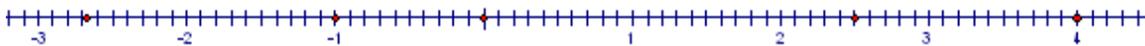
88. $-4w + 12 \geq 10$ or $5w - 14 > -4$

89. $4|3p - 2| + 5 = 11$

90. $5|d + 8| - 7 > 13$

91. $6|3x + 5| \leq 14$

Solutions

1.

2. $-2 < -\dfrac{1}{2}$ 3. False   4. True   5. True   6. True

7. 12   8. 4   9. 2   10. -10   11. 8

12. -2.8   13. -9   14. 3cd   15. 2   16. -2

17. $3x^2 - 5x + 1$ 18. 16   19. 3   20. 25   21. -1

22. 2   23. ϕ 24. 3   25. -7.5   26. -4

27. 3   28. $\Re$ 29. 4   30. $x = \dfrac{5}{2}y + 5$

31. $v = \dfrac{s}{t} + \dfrac{1}{2}gt$ 32. $60 - w$ 33. $150 - \dfrac{1}{2}b$ 34. $\dfrac{1}{2}x + 2$

35. (a) $x(x-2)$ cm^2 or $x(x+2)$ cm^2 (b) $(4x + 4)$ cm   36. $9r$ miles apart

37. $(0.15q + 1.80)$ dollars   38. Maria - \$19, Amy - \$11   39. 180 records

40. 49 ft x 84 ft   41. 51^0 42. 12:15 pm   43. 34 dimes and 6 quarters

44. 2:30 pm   45. 5   46. 2   47. $b = 2m - a$

48. $2(n + n^2)$ 49. $4x + 10$ 50. 2 ½ hours   51. 2

52. 0   53. 3   54. $a + ½$ 55. 1

56. $7m - 4n$ 57. $2x + 5y$ 58. $2a^2$ 59. -3

60. $-6 + 5x$ 61. 16   62. 1   63. $h = \dfrac{A}{2\pi} - r$

64. $3x - 6$ 65. $12 - y$ 66. 42 pencils   67. 75 miles

68. 2   69. $-1, -0.8, -0.2, 0.6, 1.4$ 70. 25

71. 2   72. $3 - m$ 73. 4   74. $19x - 34y$

75. 8   76. $4x^2 - 3$ 77. $\dfrac{9}{5}$ 78. 42

79. 4   80. -20 81. 20

82. $(\dfrac{1}{4}x + 10)$ gallons   83. \$2400 at 5% and \$3600 at 7%

84. $x \geq 3$ 85. no solution   86. $\Re$ 87. $-\dfrac{1}{2} \leq t \leq 1$

88. $w \leq \dfrac{1}{2}$ or $w > 2$ 89. $\dfrac{7}{6}, \dfrac{1}{6}$ 90. $d < -12$ or $d > -4$ 91. $-2\dfrac{4}{9} \leq x \leq -\dfrac{8}{9}$