## Midland Park Math Department
## Algebra 2 Honors Summer Assignment

The following Algebra topics have been covered in Algebra 1 Honors, but will be essential for you to review and practice over the summer in preparation for Algebra 2 Honors. We strongly suggest you take time to review your notes and practice the problems provided along with additional practice items on your own. Students should spend **sufficient time** over the summer to become fluent in the topics mentioned below.

You will need to have **mastered** the following Algebra 1 topics:

- Solving multi-step equations and inequalities
- Finding slope, graphing linear equations, and finding linear equations
- Solving systems of linear equations
- Factoring quadratics and solving quadratics by factoring

The following are helpful websites to find notes, videos, or good example problems to practice:

- www.khanacademy.com
- www.purplemath.com

The summer assignment will be reviewed within the first several days of the new year to be followed by a test on the material in the packet. Students should make every effort during the first several days to review their answers to be ready for the test.

**Follow all directions!**

1. This assignment is to be handed in to your Algebra 2 Honors teacher on the first day of the school year.

2. Clearly write the problem number and show all your work on separate sheets of paper. Staple your completed assignment together. This is what will be handed in.

3. The summer assignment will count as a quiz grade for the first marking period. There will also be a test given based on the material in this packet within the

## Section 1: Solving Multi-Step Equations and Inequalities

**Practice:** Solve the following equations. Show all work.

1. $2\left(\frac{2}{5}x - 3\right) - \frac{5}{2} = -\frac{19}{8} + 2x$

2. $-3\left(4x + \frac{7}{8}\right) + \frac{4}{5}(6x + 1) = 43$

3. $x - \frac{1}{11} = 5x + \frac{3}{5}x - 8$

4. You start with \$20.55 and save \$6 each week. Write an algebraic expression that models the total amount you save. How many weeks would you have to save if you wanted to save \$450?

**Practice:** Work with the following expressions. Show all work.

5. Solve $A = \frac{1}{2}h(b_1 + b_2)$ for $b_1$.

6. Solve $I = \frac{PN}{PN+1}$ for $N$.

7. Solve $V = \frac{1}{3}\pi h^2(3r - h)$ for $r$.

**Practice:** Solve the following inequalities. Show all work.

8. $\frac{3}{16}\left(\frac{8}{5} - 2x\right) - 2x \leq -32$

9. $7.5 + 4.5m \leq 2 \; or \; m + 15.7 > 25.6$

10. $-53 < 9v + 4 < -26$

**Section 2: Finding Slope, Graphing Linear Equations, and Finding Linear Equations**

**Practice:** Find the parallel and perpendicular slopes of each set of points. Show all work.

11. $\left(7, \frac{2}{3}\right)$ and $(-2, -1)$

12. $(0, -2)$ and $(4, -2)$

13. $(\frac{3}{8}, -5)$ and $(6, 10)$

**Practice**: Find the slope and y-intercept of the following equations. Then graph. Show all work.

14. $6y = 2x + 3$

15. $4x + 3y = -4$

16. $-5x + 2y = -8$

**Practice:** Write the equation of a line that passes through the following pairs of points. Show all work.

17. $(3, -9)$ and $(-2, 8)$

18. $(4, -5)$ and $(2, 9)$

19. $(-7, 0)$ and $(0, -6)$

## Section 3: Solving Systems of Linear Equations

**Practice:** Solve the following systems using substitution. Show all work.

20. $-4x - 15y = -17$
    $-x + 5y = -13$

21. $16x - 10y = 10$
    $-8x - 7y = 6$

**Practice:** Solve each system of equations by elimination. Show all work.

22. $-6x - 7y = 14$
    $-4x - 14y = 28$

23. $-7x - 8y = 9$
    $-4x + 9y = -22$

## Section 4: Factoring Quadratics and Solving Quadratics by Factoring

**Practice:** Factor each quadratic. Show all work.

24. $49x^2 - 100$

25. $49x^2 - 56x + 16$

26. $x^2 + 10x + 25$

27. $3x^2 - 2x - 5$

28. $2x^2 + 11x + 5$

29. $4x^2 - 17x + 4$

**Practice:** Solve each quadratic by factoring. Show all work.

30. $4x^2 + 9x + 5 = 0$

31. $8x^2 + 18x + 9 = 0$

32. $x^2 - 10x + 22 = -2$