9th Grade Math Academy – Two Tracks

9th Grade Advanced and Regular Tracks - Overview

- In the 9th Grade *Regular Track*, we review 7th and 8th grade algebra in the first four weeks of the year.

- Students who do not need much of this review (including those who were in the 8th Grade Math Academy and did very well with the *Algebra* unit) are placed in the *Advanced Track*.

- Those in the *Advanced Track* **start the Math Academy two weeks later** (after the normal start date of the Math Academy school year). They then complete the first four weeks of work in only two weeks, and then get into sync with the rest of the 9th grade class in Week #5. These students also may take an extra, three-week-long, advanced-only unit at the end of the year for no additional cost.

Which "track" should you be in?

- The "Regular 9th Grade Track". Look at "Sample Problems from 8th Grade Algebra", below. In the regular track, we start out in the first few classes by reviewing problems like this (and we will do some new, fun stuff, too!). Most 9th grade Math Academy students – even those who did well in 8th grade – benefit from doing review like this. If that all sounds good to you, then you should be in the **Regular 9th Grade Track**. (Most 9th Graders are placed in the "Regular" track.)

- The "Advanced 9th Grade Track". If you really feel you don't need much review, and after looking at the 8th Grade Algebra problems you feel like you could do most of these problems quite easily, then it may be best for you to be in the **Advanced 9th Grade Track.**

- The 10th Grade Math Academy. Look at the "Sample Problems from the 9th Grade Math Academy", below. If you feel you could do most of these problems quite easily, and you have already taken an *Algebra I* course last year (perhaps in another school), and you learned the material quite well, then it may be best for you to be in the **10th Grade Math Academy.**

Sample Problems from 8th Grade Algebra

Simplify.

1) $9 - 15$

2) $28 - 32$

3) $(3)(-7)$

4) $(-3)(-7)$

5) $(-15) \div (-5)$

6) $7 - +11$

7) $-3 - -9$

8) $9 - 7(8 - 5 \cdot 2)^2 - 5$

9) $x^6 \cdot x^3$

10) $6x^3 - x^3$

11) $-X - 2 - 6X + 8$

Solve each equation.

12) $7X + 38 = -2X - 7$

13) $-9X = -36$

14) $\frac{8}{9} = \frac{12}{X}$

15) $19 - 3(2X - 7) + 5X$
$= 3X + 4(X - 8)$

Sample Problems from the 9th Grade Math Academy

Simplify.

1) $(x + 5)^2$

2) $7x^2(x^2 + 7x - 5)$

3) $(2x - 3)(5x + 2)$

4) $(x - 10)(x + 1)(x - 3)$

5) $\frac{3x^{-5}y^2}{6x^3y^{-3}z^{-2}}$

Factor.

6) $x^2 + 13x - 30$

7) $x^4 - 25$

8) $10x^3 + 30x^2 - 40x$

Find the Common Solution.

9) $3x - 4y = 26$
$2x + 5y = -21$

Solve. Use the quadratic formula only if necessary.

10) $7 + 3(x - 4)$
$= 5x - 4 - x$

11) $\frac{3}{x + 4} = \frac{5}{3x - 7}$

12) $x^2 + 3x = 10x - 12$

Details about the 9th Grade Tracks

- If you are in the "regular" track, then it is straightforward - you will simply follow the lectures and assignments in their normal order for the whole year (all 32 weeks). Often, the workbook assignments have both "Section A" (which is generally easier), and "Section B" (which is generally more challenging). You may decide to focus mostly on the section A problems and only occassionally do problems from section B.

- If you are in the "advanced" track, then you need to keep these things in mind:

  1. You will start the Math Academy school year two weeks after everyone else.

  2. The first four weeks of lectures and assignments focus a good amount on review topics that you are likely very familiar with from 8th grade. Therefore we recommend that students in the advanced track complete these first four weeks in only two weeks. For the assignments in these first four weeks, you will need to focus on those problems that you feel you need to work on, and will likely skip over many of the problems that are not necessary for you. For the lectures, we recommend that you do the following:
  (Note that W1L1 means "Week #1, Lecture #1)

     During your first week of the Math Academy, watch these lectures:
     - W1L1: Watch all of it!
     - W1L2: Watch from the beginning up until 19:10.
     - W2L1: Start watching at 25:13.
     - W2L2: Skip this lecture.

     During your second week of the Math Academy, watch these lectures:
     - W3L1: Skip this lecture.
     - W3L2: Watch all of it!
     - W4L1: Watch all of it!
     - W4L2: Watch all of it!

  3. From week #5 onwards, it will likely be best to proceed at the normal pace of two lectures per week. You will then be in sync with the students in the regular track (which is necessary if you are in a tutorial group).

  4. If your (Tuesday/Thursday) student work group has students from both the advanced and regular tracks, then it is likely best that everyone meets together in the first four weeks. Even though the advanced students are not starting to watch the lectures until Week #3, this is not a problem for the group meetings because the group assignments consist mostly of puzzles not related to the lectures or workbook problems.

  5. For the rest of the year, when looking at the assignments from the workbook, remember that there are usually many easier review problems designed for those students who need the extra practice. You might decide to skip many of these problems – but be careful! don't skip too many! Usually, you should try to do most of the "Section B" problems (which are generally more challenging).

  6. In particular, note that you should really practice the **monster-fraction problems** in the *Algebra Basics* unit. These problems require careful work and are great practice for those in the advanced track. Likely in the beginning, you will often get these problems wrong. You goal is to get to the level where you get these problems correct most of the time.

  7. Students in the advanced track are also encouraged to participate in an extra Math Academy three-week unit at the end of the year. This extra unit will take you three weeks past the normal Math Academy end date. Students in the regular track, who have been succesful in their algebra studies, are also welcome to participate in this extra unit.

  8. Perhaps, above all, as a high school student, you need to take more responsibility for your own learning, and make sure you are challenging yourself.