

# 9<sup>th</sup> Grade Math Academy – Two Tracks

## 9<sup>th</sup> Grade Advanced and Regular Tracks - Overview

- In the 9<sup>th</sup> Grade *Regular Track*, we review 7<sup>th</sup> and 8<sup>th</sup> 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 8<sup>th</sup> Grade Math Academy and very well with the *Algebra* unit) are placed in *Advanced Track*.
- Those in the *Advanced Track* **start the Math Academy two weeks late** (after the normal first day of the Math Academy school year). They then complete the first four weeks of work in only two weeks, and then join the rest of the 9<sup>th</sup> 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 9<sup>th</sup> Grade Track”. Look at “Sample Problems from 8<sup>th</sup> 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 9<sup>th</sup> grade Math Academy students – even those who did well in 8<sup>th</sup> grade – benefit from doing review like this. If that all sounds good to you, then you should be in the **Regular 9<sup>th</sup> Grade Track**. (Most 9<sup>th</sup> Graders are placed in the “Regular” track.)
- The “Advanced 9<sup>th</sup> Grade Track”. If you really don’t feel you need much review, and after looking at the 8<sup>th</sup> 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 9<sup>th</sup> Grade Track**.
- The 10<sup>th</sup> Grade Math Academy. Look at the “Sample Problems from the 9<sup>th</sup> 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, and you learned the material quite well, then it may be best for you to be in the **10<sup>th</sup> Grade Math Academy**.

### Sample Problems from 8<sup>th</sup> 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 9<sup>th</sup> 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 occasionally 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 8<sup>th</sup> 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 more problems than normal. 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. 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).
5. 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. Your goal is to get to the level where you get these problems correct most of the time.
6. The advanced track will also be invited 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.
7. 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.