

SAT Math Unit 1: Heart of Algebra

Bronx Early College Academy

Christopher J. Huson PhD

8-23 September 2022

1.1 Linear equations	8 September
1.2 Solve for length	9 September
1.3 Terminology and notation	12 September
1.4 Midpoint and bisector	13 September
1.5 Equilateral and isosceles triangles, perimeter	14 September
1.6 Roundtable review	15 September
1.7 Unit conversion, Exit note quiz	16 September

Learning Target: I can model a linear situation in context

SAT: Using algebra to analyze and solve problems in context, 1.1 Thursday 8 Sept

Do Now: Take out math materials

1. Math notebook, math pocket folder
2. Lined paper, pen or pencil
3. Casio Calculator

Lesson: Identify and implement the steps necessary to use algebra to analyze and solve problems in context

Homework (on home computer or phone):

1. Register for Khan Academy SAT practice
2. Take the Math Diagnostic Quiz 1
3. Begin practice problems: Interpreting linear functions, linear equations / functions word problems

Solve the problem with the partner seated next to you

The class will be divided among the three problems

1. In 2014, County X had 783 miles of paved roads. Starting in 2015, the county has been building 8 miles of new paved roads each year. At this rate, how many miles of paved road will County X have in 2030?
2. In 2014, County X had 783 miles of paved roads. Starting in 2015, the county has been building 8 miles of new paved roads each year. At this rate, if n is the number of years after 2014, which of the following functions f gives the number of miles of paved road there will be in County X?
3. In 2014, County X had 783 miles of paved roads. Starting in 2015, the county has been building 8 miles of new paved roads each year. At this rate, in which year will County X first have at least 1,000 miles of paved roads?

(Assume that no paved roads go out of service.)

As you complete the problem record the following:

1. Solve the problem—show all work and answer the question.
2. What do you need to know in order to be able to solve this problem?
3. What is the process you used to solve this problem?

Problem 2 (continued)

...which of the following functions f gives the number of miles of paved road...

1. $f(n) = 8 + 783n$
2. $f(n) = 2014 + 783n$
3. $f(n) = 783 + 8n$
4. $f(n) = 2014 + 8n$

Take class notes in a composition book

What do you need to know to solve each problem?

- ▶ What a variable is, and how to define a variable.
- ▶ How to write an expression.
- ▶ How to substitute-in a value for a variable.
- ▶ How to create a function for a given situation/context.
- ▶ How to solve an equation/inequality.
- ▶ How to interpret a solution.

Create a list of steps for solving these types of problems.

- ▶ Define one or more variables that represent quantities in the question.
- ▶ Write one or more equations, expressions, inequalities, or functions that represent the relationships in the question.
- ▶ Solve the equation, and interpret the solution in terms of what the question is asking.

Solve the problem by yourself

4. To edit a manuscript, Miguel charges \$50 for the first 2 hours and \$20 per hour after the first 2 hours. Which of the following expresses the amount, C , in dollars, Miguel charges if it takes him x hours to edit a manuscript, where $x > 2$?

1. $C = 20x$
2. $C = 20x + 10$
3. $C = 20x + 50$
4. $C = 20x + 90$

When you and the person next to you are done, discuss and compare your solutions.

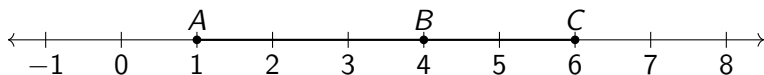
Learning Target: I can solve for segment lengths

CCSS: HSG.CO.A.1 Know precise geometric definitions

1.2 Friday 9 September

Do Now: Given $A(1)$, $B(4)$, $C(6)$.

Write down AB , BC , and AC .



Lesson: Segment addition, solving algebraic models

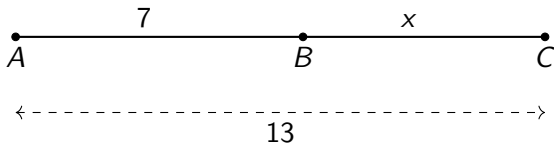
Homework: Problem set 1.2 (plus optional spicy worksheet)

Learning Target: I can use geometric conventions

CCSS: HSG.CO.A.1 Know precise geometric definitions

1.3 Monday 12 Sept

Do Now: Given collinear points A , B , C , with $AB = 7$, $AC = 13$.



1. Circle the equation that most simply represents the situation.

$$7 + x = 13$$

$$x = 13 - 7$$

2. Find BC .

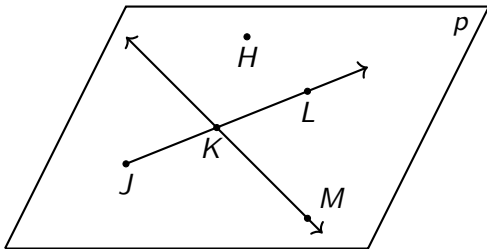
Learning Target: I can *bisect* a length

CCSS: HSG.CO.A.1 Know precise geometric definitions

1.4 Tuesday 13 Sept

Do Now: Circle or mark each object in the plane

1. The point H
2. The ray \overrightarrow{JL}
3. The name of the plane shown



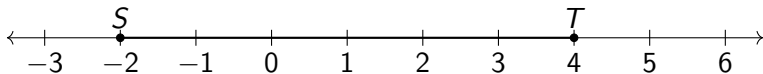
Lesson: Midpoint, congruence, bisection

Learning Target: I can work with objects having congruent parts

CCSS: HSG.CO.A.1 Know precise geometric definitions

1.5 Wednesday 14 Sept

Do Now: Given \overline{ST} with $S(-2)$ and $T(4)$



What is the length of the segment \overline{ST} ? Show your work as an equation.

Lesson: Perimeter, congruent line segments in rectangles & isosceles triangles

Learning Target: I can collaborate in review

CCSS: HSG.CO.A.1 Know precise geometric definitions 1.6 Thursday 15 September

Do Now: Given the points X and Y , draw \overrightarrow{YX} .

(careful! which direction does it go?)

\dot{X}

\dot{Y}

Lesson: Roundtable quiz review

Learning Target: I can change units of length

CCSS: HSG.CO.A.1 Know precise geometric definitions

1.7 Friday 16 September

Do Now: Mike is six feet tall. How many inches is that?

Conversion: 1 foot = 12 inches

Exit note quiz today