Mathematics Class Slides

Bronx Early College Academy

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5-21 September 2018

GQ: How do we define functions?

CCSS: HSF.IF.C.7 Analyze functions 1.1 Thursday 5 Sept

Do Now Handout: Algebra skills check

1. Welcome back to school!
2. Assigned seating: arrange yourself alphabetically by last name, left to right, front to back.
3. Take out notebooks (or blank paper) & calculator
4. Complete handout problem set

Lesson: Linear functions, slope, solving; vertical line test p 4-6
Homework: Problem set: Function identification 1A & 1B p. 6-7

GQ: What are domain and range?

CCSS: HSF.IF.C.7 Analyze functions 1.2 Friday 6 Sept

Do Now: Substitution notation

1. Handout, IB exam problem
2. Challenge: Verify the following Pythagorean identity for all values of x and y:

$$(x^2 + y^2)^2 = (x^2 - y^2)^2 + (2xy)^2$$

Homework review
Lesson: Domain, range, function review

Calculator deposits $20

Homework: Polynomial simplification, graphing linear functions
Due: notebook, folder, calculator

GQ: What is the appropriate precision for a calculation?

CCSS: MP5 Attend to precision 1.3 Monday 9 Sept

Do Now: Textbook chapter warmup, use looseleaf paper

1. Skills check #1-3 p. 3

Lesson: Rounding, significant figures, error bars pp. 1-5
Exercise 1A, #1-2, p. 5

Homework: Calculation and rounding practice

GQ: How do we measure the bounds of errors?

CCSS: MP5 attend to precision 1.4 Tuesday 10 Sept

Do Now: Calculator practice

1. Chapter review #1 p. 39
2. Pay careful attention to saving calculator values, rather than copying to paper and reentering.
3. Check your answers in back of book, p. 766

Lesson: Bounds and errors pp. 6-8

Practice exercises 1B p. 8-9
Homework: Function substitution, domain and range

GQ: How do we write very large or small numbers?

CCSS: MP5 attend to precision 1.5 Wednesday 11 Sept

Do Now: Precision practice

1. Practice exercises 1B p. 8-9
2. Pay careful attention to saving calculator values, rather than copying to paper and reentering.
3. Check your answers in back of book, p. 765

Lesson: Exponents & scientific notation pp. 9-12

Note exponent rules top of page 11

Homework: Practice exercises 1C p. 12-13

GQ: How do we calculate the side lengths of a right triangle?

CCSS: MP5 attend to precision 1.6 Thursday 11 Sept

Do Now: Precision practice

1. Chapter review #2 p. 39
2. Which will be easier to use, scientific notation or the fully expanded number?
3. Use proper notation to display your answer clearly

Homework review

Lesson: Right triangle trigonometry pp. 13-15

Angle of elevation and depression page 11

Homework: Practice exercises 1D p. 16-17

GQ: How do we calculate the side lengths of a non-right triangle?

CCSS: MP5 attend to precision 1.7 Friday 13 Sept

Do Now: Precision practice

1. Chapter review #3 p. 39
2. Learn how to use the calculator to solve an equation. (multiple methods)

Lesson: Non-right triangles and the sine rule pp. 17-21

The ambiguous case page 21

Homework: Practice exercises 1E p. 21-22

GQ: How do we calculate the area of a triangle?

CCSS: MP5 attend to precision 1.8 Monday 16 Sept

Do Now: Precision practice

1. Chapter review #4b p. 39
2. Note that both $\frac{15}{\sin 31} = \frac{13.4}{\sin R}$ and $\frac{\sin 31}{15} = \frac{\sin R}{13.4}$.

   Which is easier to solve?

Lesson: Practicing applying the sine rule pp. 17-21
The ambiguous case page 21
The sine formula for the area of a triangle page 22

Homework: Practice exercises 1E p. 21-22

GQ: How do we practice the law of sines?

CCSS: MP5 attend to precision 1.9 Tuesday 17 Sept

Deltamath practice: scientific notation, trig

1. Laptops, login with Teacher ID 546068
2. Do Deltamath sections in order
   Practice comes first, then new topics
3. Work extra problems on the skills you need to practice

New material: The sine formula for the area of a triangle page 22
Radian / degree conversion; law of cosines

Homework: Complete Deltamath problems, 10:00PM deadline

GQ: How do we calculate the angles of a triangle?

CCSS: MP5 attend to precision 1.10 Wednesday 18 Sept

Do Now: Precision practice

1. Chapter review #6 p. 39

Lesson: The cosine rule pp. 23-24
The sine formula for the area of a triangle page 22

Homework: Practice exercises 1F p. 24-25

GQ: How do we "solve" a triangle?

CCSS: MP5 attend to precision 1.11 Thursday 19 Sept

Do Now: IB exam problems

1. Applications of the sine and cosine rules

Lesson: The cosine rule pp. 23-24
The sine formula for the area of a triangle page 22

Homework: Study Arc length and area of sector
Oxford textbook pp. 25-27
Deltamath, practice circle sectors and arc length
Khan Academy, log in and use videos as resource (DrHuson)

GQ: How do we calculate the angles of a triangle?

CCSS: MP5 attend to precision 1.12 Friday 20 Sept

Do Now: Precision practice

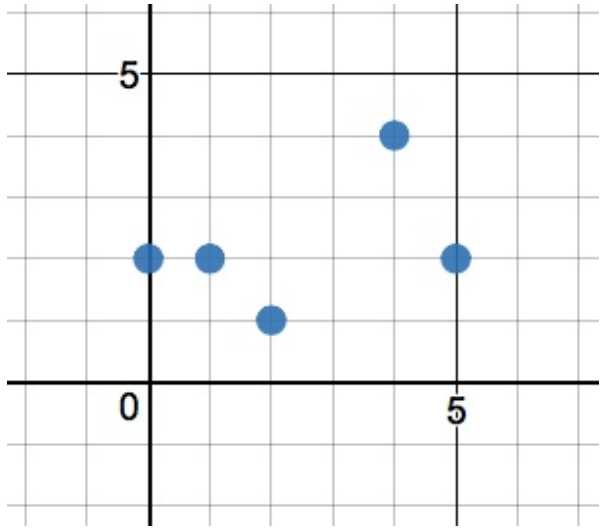
1. Chapter review #6 p. 39

Lesson: The cosine rule pp. 23-24
The sine formula for the area of a triangle page 22

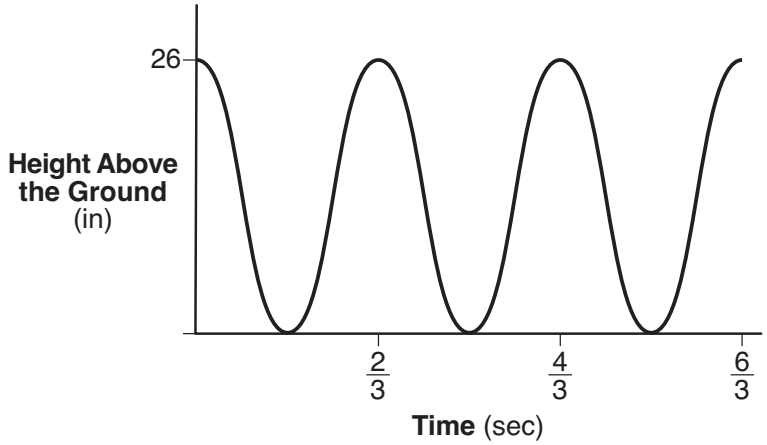
Homework: Practice exercises 1F p. 24-25

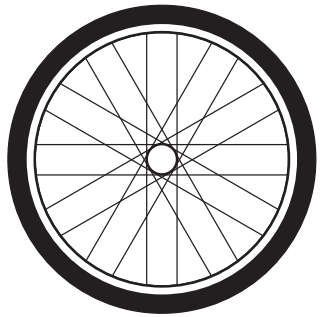
Domain and range of a function 1.5

1. Write down the domain and range of the function graphed



2. What is the range of this function modeling a bicycle wheel?





Function substitution 1.5

Given $f(x) = 3x + 2$. What is $f(2x - 1)$?

1. Perform the substitution, putting $2x - 1$ in parenthesis.

2. Simplify, beginning each line with a leading equals sign if it is equal to the line above.

GQ: How do we solve quadratic equations?

CCSS: HSF.IF.B.4 Interpret key features of functions and their graphs 1.4 Tuesday 10 Sept

Do Now: Factoring

1. Find the intercepts, axis of symmetry, and minimum point of the graph of the function $f(x) = (x-1)(x-5)$?
2. Factor the function $g(x) = x^2 - x - 12$ to determine the features of its graph.
3. Convert the function $h(x) = x^2 + 4x + 3$ to the vertex form, $h(x) = a(x-h)^2 + k$. Write down its vertex.

Lesson: Factoring, setting $= 0$, checking solutions, $x-$ and $y-$intercepts, vertex, axis of symmetry

Homework: Factoring practice, completing the square, graphing
Skip around and do what you can by tomorrow

How do we graph quadratics?

CCSS: HSF.IF.B.4 Interpret key features of functions and their graphs 1.5

Consider the function $f(x) = -x^2 + 2x + 3$

1. Factor f and state its zeros.
2. Restate f in vertex form. Write down the vertex as an ordered pair.
3. Over what intervals is the function increasing, decreasing, and neither?
4. If $f(x)$ represents the height of a diver over the domain $0 \leq x \leq 3$, interpret $f(0)$, the vertex, and $f(3)$
5. What does the "slope" of the curve represent?

Lesson: Example 18 p. 54

How do we communicate mathematical results?

CCSS: MP.4 Model with mathematics 1.6

Technical skills needed to communicate mathematics

1. Word processing: Microsoft Word and equation editor
2. Computer calculators: Desmos; domain restriction, labeling
3. Cloud storage: Dropbox
4. Technical writing standards: MLA format (Purdue OWL)
5. Writing style: declarative
6. Assessment criteria: IB exploration criterion *B: Mathematics Presentation*

Lesson: Shared folder structure, graph copy/paste, MLA template

Homework: Pre-test

GQ: How do we simplify exponents?

CCSS: HSN.RN.A.2 Rewrite expressions involving radicals and rational exponents using the properties of exponents 1.7

Do Now: Exponent and radicals practice

1. Exponent product, quotient, and power rules
2. Fractional exponents
3. Negative exponents
4. Graphing exponential function

Lesson: Product, quotient, power rules, $\sqrt{x^4}$

Homework: Exponent and radicals practice