

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 asymptotic behavior?

CCSS: HSF.IF.B.4 Interpret key features of functions and their graphs 1.3 Monday 9 Sept

Do Now: Graphing functions

1. Graph #3a, p. 12 and one other from problem 3. Use 1 cm = 1 unit

Review Average rate of change problem set

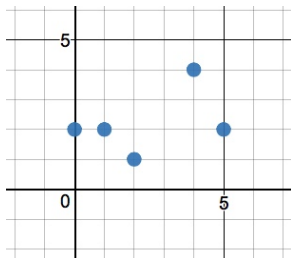
Lesson: Rational functions, factoring denominators, asymptotes
pp. 8-11

Homework: Function substitution, domain and range

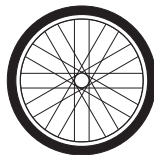
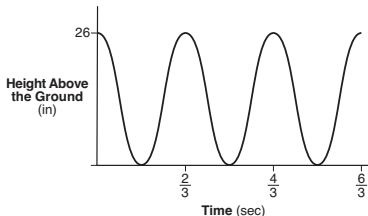
Domain and range of a function

1.3

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

1.3

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