

# Mathematics Class Slides

## Bronx Early College Academy

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2 March 2020

6.1 Intro to calculus	Wednesday 26 February
6.2 Intro to calculus	Thursday 27 February
6.3 Power rule - Deltamath practice	Friday 28 February
6.4 Review calculator functions	Monday 2 March
6.5 Quiz calculator functions, Deltamath calculus	Tuesday 3 March
6.6 Solve for extrema with derivative	Thursday 5 March
6.7 Solve for extrema with derivative	Friday 6 March
6.8 Solve for extrema with derivative	Monday 9 March
6.9 DN Quiz, Gradescope review	Tuesday 10 March
6.10 Derivatives of exp, trig function	Wednesday 11 March

## GQ: How do we graph tangents to functions?

CCSS: HSF.IF.C8.A Understanding rate of change

6.1 Wednesday 26 February

### Do Now: Linear equation practice

1. Write down the equation of the line through  $(2, -3)$  with slope  $m = 2$
2. Write down the equation of the line through  $(-1, 0)$  perpendicular to the line with slope  $m = 2$
3. Sketch the function  $f(x) = x^2 + 1$  and  $g(x) = -2x$  on the same axes

Lesson: Polynomial function terminology, the power rule

Homework: Deltamath calculus practice

## GQ: How do we graph tangents to functions?

CCSS: HSF.IF.C8.A Understanding rate of change

6.2 Thursday 27 February

### Do Now: Linear equation practice

1. Write down the equation of the line through  $(2, -3)$  with slope  $m = 2$
2. Write down the equation of the line through  $(-1, 0)$  perpendicular to the line with slope  $m = 2$
3. Sketch the function  $f(x) = x^2 + 1$  and  $g(x) = -2x$  on the same axes

Lesson: Polynomial function terminology, the power rule

Homework: Deltamath calculus practice

## GQ: How do we graph tangents to functions?

CCSS: HSF.IF.C8.A Understanding rate of change

6.3 Friday 28 February

### Do Now: Differentiation of polynomials practice

1. Find the derivative of  $h(x) = x^2 + 5$
2. Given  $g(x) = x^3 + 12x^2 - 1$ . Find  $g'(x)$
3. Given  $f(x) = x^3 + 7$ .
  - 3.1 Find  $f(-1)$
  - 3.2 Find  $f'(x)$
  - 3.3 Find the derivative of  $f$  when  $x = -1$ .
  - 3.4 Write down the equation of the tangent to  $f$  at  $x = -1$

Lesson: Apply the power rule for taking derivatives

Classwork: Deltamath calculus practice (finish for homework)

## GQ: How do we graph tangents to functions?

CCSS: HSF.IF.C8.A Understanding rate of change

6.4 Monday 2 March

Do Now:  $f(x) = x^3 - 5x^2 + 5x + 2$

1. What point does  $f$  go through when  $x = 1$ ?
2. Find  $f'(x)$
3. What is the slope of the line tangent to the function when  $x = 1$ ?
4. Write down the equation of the tangent to  $f$  at  $x = 1$
5. Graph the function and its tangent at  $x = 1$  on your calculator.
6. Sketch the graph.

Lesson: Using the Casio to calculate derivatives

Classwork: Practice calculator functions (pop quiz warning!)

## GQ: How do we graph tangents to functions?

CCSS: HSF.IF.C8.A Understanding rate of change

6.4 Monday 2 March

### Calculator practice

1. Find the solutions for the system,  $f(x) = g(x)$ .

$$f(x) = -2x^2 + 5x + 7 \quad g(x) = -2x + 4$$

2. Perform a linear regression on the data, finding  $y = ax + b$ .

$x$	17	18	17	19	23	15	16
$y$	71.1	78.6	69.2	71.2	80.5	55.7	58.4

- 2.1 Write down the value of  $a$ ,  $b$ .
- 2.2 Write down the correlation coefficient  $r$ .
- 2.3 Use your regression line to estimate  $y$  for  $x = 22$ .
3.  $a = 12.3$ ,  $b = 14.7$ ,  $\theta = 71^\circ$ . Find the third side length,  $c$ .
4.  $a = 11.4$ ,  $b = 17.1$ ,  $c = 16.0$ .

## GQ: How do we graph tangents to functions?

CCSS: HSF.IF.C8.A Understanding rate of change

6.5 Tuesday 3 March

### Do Now Quiz: Calculator functions D

1. Solving systems of equations with handheld technology
2. Linear regression
3. Using the Casio to calculate derivatives

Classwork: Deltamath calculus Equations of tangent lines

Homework: Complete Deltamath



## GQ: How do we solve for extrema?

CCSS: HSF.IF.C8.A Understanding rate of change

6.6 Thursday 5 March

### Do Now: Calculator functions E

1. Solving systems of equations with handheld technology
2. Statistical summary of frequency table data
3. Using the Casio to calculate derivatives

Classwork: Solving for horizontal tangent lines

Homework: Practice calculator functions (quiz tomorrow!)

## GQ: How do we solve for extrema?

CCSS: HSF.IF.C8.A Understanding rate of change

6.7 Friday 6 March

### Do Now Quiz: Calculator functions F

1. Tangent to a polynomial function
2. Solving systems of equations with handheld technology
3. Statistical summary of frequency table data
4. Using the Casio to calculate derivatives

Classwork: Solving for horizontal tangent lines

Homework: Practice calculator functions

## GQ: How do we solve for extrema?

CCSS: HSF.IF.C8.A Understanding rate of change

6.8 Monday 9 March

### Do Now: Calculator functions G

1. Tangent to a polynomial function
2. Solving systems of equations with handheld technology
3. Complex calculations: Law of cosine applications
4. Using the Casio to calculate derivatives

Lesson: The derivative of a fractional or negative exponent

Solving for horizontal tangent lines; polynomial end behavior, roots

Homework: Deltamath differentiation practice

Practice calculator functions (quiz tomorrow?)

## GQ: How do we solve for extrema?

CCSS: HSF.IF.C8.A Understanding rate of change

6.9 Tuesday 10 March

### Do Now Quiz: Calculator functions H

1. Tangent to a polynomial function
2. Solving systems of equations with handheld technology
3. Complex calculations: Law of cosine applications

Lesson: Polynomial end behavior, roots

Classwork: Deltamath differentiation practice

Homework: complete Deltamath problem set

## GQ: How do we differentiate exponential & trig functions?

CCSS: HSF.IF.C8.A Understanding rate of change

6.10 Wednesday 11 March

### Do Now: Calculator functions J

1. Tangent to a negative power of  $x$
2. Solving systems of equations with handheld technology
3. Applications of sine function, radians and degrees

Lesson: Polynomial end behavior, roots

Classwork: Solving for extrema algebraically

Homework: Study for quiz, complete Deltamath