

Mathematics Class Slides

Bronx Early College Academy

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GQ: How does a function's graph relate to its derivatives?

CCSS: HSF.IF.B.4 Interpret key features of functions and their graphs 4.1

Do Now: Differential calculus

1. Take the 1st & 2nd derivatives of $f(x) = x^3 - 6x^2 + 6x$.
2. Sketch the function.

Challenge: Identify key features, graphically & algebraically.

Lesson: Function graphs, extrema, the 1st & 2nd derivative tests
p. 233, 240

Task: 7Q p. 232 #1-3; 7R p. 234 1, 2; 7S p. 236 1, 3

Assessment: Handout graphing problem #1 (#2 challenge)

Homework: IB function / graphing problem set

GQ: How does a function's graph relate to its derivatives?

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4.2

Do Now: Given $f(x) = x \cos x, 0 \leq x \leq 2\pi$.

1. Take the 1st & 2nd derivatives of $f(x)$.
2. Sketch the function.
3. Over what intervals is the function increasing, decreasing?

Lesson: Function graphs, extrema, the 1st & 2nd derivative tests
p. 233, 240

Task: 7Q p. 232 #1-3; 7R p. 234 1, 2; 7S p. 236 1, 3

Assessment: Handout graphing problem #1 (#2 challenge)

Homework: Test corrections Paper 1

GQ: How does a function's graph relate to its derivatives?

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4.3

Do Now: Given $f(x) = -x^4 + 2x^2 + x$. There are x -intercepts at $x = 0$ and $x = p$. There is a maximum at A where $x = a$, and a point of inflection at B where $x = b$.

1. Find the value of p .
2. Write down the coordinates of A.
3. Write down the rate of change of f at A.
4. Find the coordinates of B.
5. Write down the rate of change of f at B.

Lesson: The 1st & 2nd derivative tests p. 233, 240

Task: 7Q p. 232 #1-3; 7R p. 234 1, 2; 7S p. 236 1, 3

Assessment: Calculator calculus functions in Do Now.

Homework: Handout IB function / graphing problem set

GQ: How does a function's graph relate to its derivatives?

CCSS: HSF.IF.B.4 Interpret key features of functions and their graphs 4.4

Do Now: Find the 1st derivative of the function and solve for it's zeros as potential extrema (stationary points). Use the 1st derivative test to determine whether it is a max, min, or neither.

1. $f(x) = x^3$.

2. $f(x) = \frac{x^2 - 4}{x^2 - 1}$

Lesson: The 1st & 2nd derivative tests p. 233, 240

Task: Homework review; 7Q p. 232 #1-3; 7R p. 234 1, 2; 7S p. 236 1, 3

Assessment: Use of the 1st & 2nd derivative tests

Homework: Study for test tomorrow

GQ: How do we prepare for the IB final exams?

CCSS: HSF.IF.B.4 Interpret key features of functions and their graphs 4.5

Do Now: 1st & 2nd derivatives of a cubic function, sketch

1. Given the function $f(x) = x^3 - 9x$
2. Find $f'(x)$ and $f''(x)$.
3. Sketch f and its two derivatives on the same set of axes.
Label the intersections and extrema.

Lesson: Last minute study practices (reflection)

Task: Homework review: Work homework problems on board

Assessment: Problem set and exam mark scheme

Homework: Prepare for final exams

Interpreting a displacement vs time graph

CCSS: F.IF.B.6 Calculate & interpret the rate of change of a function

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?

GQ: How do we prepare for the IB final exams?

CCSS: HSF.IF.B.4 Interpret key features of functions and their graphs 4.6

Do Now: 1st & 2nd derivatives of a cubic function, sketch

1. Given the function $f(x) = x^3 - 9x$
2. Find $f'(x)$ and $f''(x)$.
3. Sketch f and its two derivatives on the same set of axes.
Label the intersections and extrema.

Lesson: Last minute study practices (reflection)

Task: Homework review: Work homework problems on board

Assessment: Problem set and exam mark scheme

Homework: Prepare for final exams