Mathematics Class Slides
Bronx Early College Academy

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22 October - 2 November 2018

BECA / Dr. Huson / 12.1 IB Math

GQ: What are the basic elements of vector algebra?
CCSS: HSF.IF.B.4 Interpret key features of functions and their graphs   3.1

Do Now: Differentiate each function.

1. $f(x) = x^3 - 4x$
2. $g(x) = \ln x$
3. $y = (x^3 - 4x)(\ln x)$
4. Write down the value of $\cos \dfrac{\pi}{3}$. (sketch first. no calculator)
5. Skills check #1-3 p. 404-5

Lesson: Vector concepts and notation pp. 406-410

Homework: Exercises 12A pp. 410-411

GQ: How do we differentiate functions?
CCSS: HSF-IF.B.6 Interpret functions, and their rate of change   3.2

Do Now quiz, mixed review.

Complete the problem set without a calculator, then begin Deltamath.

Lesson: Differentiation practice

Homework: Complete Deltamath problem set at home

GQ: How do we add vectors?

CCSS: HSF.IF.B.4 Interpret key features of functions and their graphs   3.3

Do Now: Differentiate each function. $k \in \mathbb{R}$

1. $f(x) = kx^2 - 4x^{-1}$
2. $g(x) = \ln kx$
3. $h(x) = e^{kx}$
4. Write down the value of $\cos \dfrac{2\pi}{3}$. (sketch first. no calculator)

Lesson: Parallelism, scalar multiplication, position, addition pp. 411-417

Homework: Exercises 12B (odds), 12C (odds), pp. 410-416

GQ: How do we calculate distance in space?
CCSS: HSG.SRT.C.8 Use the Pythagorean theorem to solve applied problems   3.4

Do Now: Differentiate each function.

1. $f(x) = x^{-1} - 4x^{-2}$
2. $g(x) = \sin x^2$
3. $y = (x^3 - 4x) \div (\ln x)$
4. Write down the value of $\sin \dfrac{\pi}{4}$. (sketch first. no calculator)

Lesson: Length calculation using the Pythagorean formula, unit vectors pp. 418-419

Homework: Exercises 12D p. 417, 12F odds p. 420.

GQ: How do we calculate distance in space?
CCSS: HSG.SRT.C.8 Use the Pythagorean theorem to solve applied problems   3.5

Do Now: Let $g(x) = \dfrac{\ln x}{x^2}$ for $x > 0$.

1. Use the quotient rule to show that $g'(x) = \dfrac{1 - 2\ln x}{x^3}$

2. The graph of g has a maximum point at A. Find the x-coordinate of A.

3. Given the point $P(4, 5)$. State the position vector $\overrightarrow{OP}$ in unit vector form.

4. Find the magnitude of $\overrightarrow{OP}$.

Lesson: Collinear points, unit vectors pp. 418-419

Homework: Exercises 12E p. 418.

GQ: How do we add vectors?

CCSS: HSG.SRT.C.8 Use the Pythagorean theorem to solve applied problems   3.6

Do Now: Let $f(x) = xe^x$.

1. Find $f'(x)$
2. The graph of f has a minimum point at A. Find the exact values of the x- and y-coordinates of A.
3. Given the point $A(5, 12)$. State the position vector $\overrightarrow{OA}$ in unit vector form.
4. Find the unit vector parallel to $\overrightarrow{OA}$.

Lesson: Adding vectors, the zero vector and equilibrium pp. 420-422

Homework: Exercises 12F (evens) p. 420, 12G (a and c) p. 422-423.

GQ: How do we differentiate functions?
CCSS: HSF-IF.B.6 Interpret functions, and their rate of change   3.7

Deltamath individualized work: Differentiation practice, vector algebra

Homework: Complete Deltamath problem set at home

GQ: How do we use vector calculations in geometric proofs?

CCSS: HSG.SRT.C.8 Use the Pythagorean theorem to solve applied problems   3.8

Do Now: Let $f(x) = x^2 \sin x$.

1. Find $f'(x)$
2. Find the gradient of f when $x = \frac{\pi}{2}$. (no calculator)
3. The graph of f has a maximum point at A, $0 \leq x \leq 2\pi$. Find the x- and y-coordinates of A. (use a graphing calculator)
4. Sketch $f(x)$ over the domain $0 \leq x \leq 2\pi$, marking the sign of the derivative on an axis. Explain how the 1st derivative test applies (p. 233).

Lesson: Geometric proofs pp. 423-424

Homework: Exercises 12H (pick 3) p. 424-5. (Deltamath)

GQ: How do we use vector calculations in geometric proofs?

CCSS: HSG.SRT.C.8 Use the Pythagorean theorem to solve applied problems   3.9

Do Now: Let $f(x) = \sin \dfrac{x}{2}$.

1. Find $f'(x)$
2. Find the gradient of f when $x = \frac{\pi}{2}$. (no calculator)
3. The graph of f has a maximum point at A, $0 \leq x \leq 2\pi$. Find the x- and y-coordinates of A.
4. Sketch $f(x)$ over the domain $0 \leq x \leq 2\pi$, marking the sign of the derivative on an axis. Explain how the 1st derivative test applies (p. 233).

Lesson: Geometric proofs pp. 423-425

Homework: Pretest handout. Exam Friday

GQ: How do we use vector calculations in geometric proofs?

CCSS: HSG.SRT.C.8 Use the Pythagorean theorem to solve applied problems   3.10

Friday Nov 9

Do Now: Let $f(x) = (2x^2 - 18)^3$.

1. Find $f'(x)$
2. Find the three values of x for $f'(x) = 0$.
3. Sketch a graph of f and show the sign of the gradient with plusses and minuses on a parallel axis.
4. Determine whether each is a maximum, minimum, or neither

Lesson: Geometric proofs pp. 423-425

Review pretest handout.

Exam next week