12.1 IB Math - Unit 6: Trig & Circular Functions

Bronx Early College Academy

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5 - 14 March 2019

6.1 Right triangle review. Tuesday 5 March

6.2 Trigonometry applications. Wednesday 6 March

6.3 The unit circle. Thursday 7 March

6.4 The unit circle. Friday 8 March

6.5 Right triangle review. Monday 11 March

6.6 Deltamath trigonometry review. Tuesday 12 March

6.7 Circle sector, arc problems. Wednesday 13 March

6.8 Periodic function situations. Thursday 14 March

6.9 Periodic function situations. Friday 15 March

GQ: How do we define and calculate right triangle measures?

CCSS: HSG.SRT.C.8 Use trigonometric ratios to solve right triangles in applied problems

6.1 Tuesday 5 March

Do Now: Calculator integration fluency

For each: sketch, solve for $f(x) = g(x)$, and find the area between the curves (write down the integration expression)

1. $f(x) = x$, $g(x) = x^2$
2. $f(x) = -x^2 + 2$, $g(x) = -1$
3. $f(x) = x^3 - 9x$, $g(x) = \sin x$

Lesson: Trig ratios, special triangles' values p. 362-9

Practice: Calculator use, Examples #1, 2 p. 365

Exam review; Reminder: complete exploration papers, parent conferences

Homework: Part 2 take-home exam: Integration, no calculator

GQ: How do we apply trigonometry to situations?

CCSS: HSG.SRT.C.8 Use trigonometric ratios to solve right triangles in applied problems

6.3 Wednesday 6 March

Do Now: Solving triangles

1. Exercise 11B #2, p. 368

Lesson: Compass directions and modeling situations p. 369-373
Exam review

Homework: Trig IB papers problem set, handout

GQ: How do we use periodic functions?

CCSS: HSF.TF.A.3 Extend trig functions with the unit circle 6.4 Thursday 7 March

Do Now: Create a unit circle and label the standard angles with their coordinate pairs.

1. *Medium* Find the values of $\sin 30°$, $\sin 45°$, & $\sin 60°$
2. *Spicy* Find $\sin \frac{\pi}{6}$, $\cos \frac{3\pi}{4}$, & $\tan -\frac{\pi}{3}$

Lesson: Periodic functions
Task: Work homework problems on board
Assessment: problem set mark scheme
Homework: Sine curves & mixed exam problems

GQ: How do we use periodic functions?

CCSS: HSF.TF.A.3 Extend trig functions with the unit circle 6.5 Friday 8 March

Do Now: Sketch the periodic function $f(x) = \sin x$

1. Label the x-axis with multiples of π, including standard fractions in the first quadrant
2. Mark the y-axis with the values of the standard angles (positive and negative).
3. Mark points on the curve at the standard angles.

Homework review

Lesson: Applications calculating the period as $\frac{2\pi}{b}$
Task: Work homework problems on board
Assessment: problem set mark scheme
Homework: Trig & mixed exam problems

GQ: How do we use periodic functions?

CCSS: HSF.TF.A.3 Extend trig functions with the unit circle 6.6 Monday 11 March

Do Now: Calculator integration fluency

Sketch, solve for $f(x) = g(x)$, and find the area between the curves (write down the integration expression and calculate)

1. $f(x) = x$ for $x > 0$, $g(x) = 2\sin x$
2. $f(x) = \sqrt{x+1}$, $g(x) = \frac{1}{2}(x+1)$
3. $f(x) = \sqrt{4-3x^2}$, $g(x) = 0$
4. The volume of #3 rotated 360° around the x-axis

Lesson: Test review, work problems on board

Homework: Trig & mixed exam problems

GQ: How do we define and calculate right triangle measures?

CCSS: HSG.SRT.C.8 Use trigonometric ratios to solve right triangles in applied problems

6.2 Tuesday 5 March

Exam review

Lesson: Deltamath trigonometry (& calculus) review

Homework: Complete Deltamath problem set

GQ: How do we measure parts of a circle?

CCSS: HSF.TF.A.3 Extend trig functions with the unit circle 6.7 Wednesday 13 March

Do Now Quiz: Special triangle trig (exact) values, no calculator

1. *Medium* Find the values of $\sin 30^\circ$, $\sin 45^\circ$, & $\sin 60^\circ$
2. *Spicy* Find $\sin \frac{\pi}{6}$, $\cos \frac{3\pi}{4}$, & $\tan -\frac{\pi}{3}$

Lesson: Circle sector, arc problems, work problems on board
Homework: 3.1, 3.2, 3.3 Trig & mixed exam problems

GQ: How do we model periodic situations?

CCSS: HSF.TF.A.3 Extend trig functions with the unit circle 6.8 Thursday 14 March

Do Now: Use a calculator to find the extrema of *one* function

1. *Mild:* $f(x) = (x-2)(x+3)(x+1)$
2. *Medium:* $g(x) = 2ln(x^2+1) - x$
3. *Spicy:* $h(x) = (x-\pi)^2 sin(x-\frac{\pi}{2})$ for $0 \leq x \leq 2\pi$

Lesson: Periodic function problems, work problems on board

Homework: 3.4, 3.5, 3.6 Trig & mixed exam problems

GQ: How do we model periodic situations?

CCSS: HSF.TF.A.3 Extend trig functions with the unit circle 6.9 Friday 15 March

Do Now: Answer using your knowledge of functions, then check by graphing with a calculator. (all questions)

1. *Mild:* What is the amplitude and midline of $f(x) = 3\sin x + 2$?
2. *Medium:* What is the period of $g(x) = -2\sin \pi x$?
3. *Spicy:* What is the equation of a periodic function with a range of $[-1, 3]$ and a period of 6π?

Lesson: Periodic function problems, work problems on board

Homework: 3.4, 3.5, 3.6 Trig & mixed exam problems