

AP Physics C Summer Assignment 2026

Mr. Brandstaedter

Part 2: Integrals

Instructions

Same as Part 1

- 1) Lesson 1: Area under the curve
 - a) Objective
 - i) Understand how to find area under curve by slicing
 - b) Video
 - i) Khan Academy Calc 1: Unit 6: Lesson 1: Introduction to integral calculus
 - (1) <https://www.khanacademy.org/math/calculus-1/cs1-integrals/cs1-accumulations-of-change-introduction/v/introduction-to-integral-calculus>
 - (2) Rough summary: how to find area under curve by slicing into rectangles
 - ii) Khan Academy Calc 1: Unit 6: Lesson 2: Riemann Sums
 - (1) <https://www.khanacademy.org/math/calculus-1/cs1-integrals/cs1-approximation-with-riemann-sums/v/simple-riemann-approximation-using-rectangles>
 - (2) Optional videos
 - (a) Above is the first video in lesson 2. There are several other videos in lesson 2. If you are having trouble with the problems assigned in this lesson (ws6,) these videos may be helpful.
 - iii) Khan Academy Calc 1: Unit 6: Lesson 6: Fundamental Theorem of Calculus
 - (1) <https://www.khanacademy.org/math/calculus-1/cs1-integrals/cs1-fundamental-theorem-of-calculus-and-accumulation-functions/v/fundamental-theorem-of-calculus>
 - (2) This video was slightly confusing to me but the main point I'd like you to know is that taking a derivative is the inverse of taking an integral.
 - c) Reading
 - i) Openstax Calculus Volume 1: Section 5.1
 - (1) <https://openstax.org/books/calculus-volume-1/pages/5-1-approximating-areas>
 - (a) I don't think you need to carefully read the first section "Sigma (summation) notation."
 - (b) Do carefully read "Approximating Area"
 - ii) Openstax Calculus Volume 1: Section 5.3: Fundamental Theorem of Calculus

- (1) <https://openstax.org/books/calculus-volume-1/pages/5-3-the-fundamental-theorem-of-calculus>
- (2) The main point I'd like you to know is that taking a derivative is the inverse of taking an integral.

d) Problems

- i) On this worksheet (ws6: Area Under Curve)
 - (1) do #1, 3, 5
- ii) https://drive.google.com/file/d/1w2k_WAUC_WR1KdHxy4s5MtlLTPIL6ZIs/view?usp=drive_link

2) Lesson 2: Definite and indefinite integrals

a) Objective

- i) The difference between a definite and indefinite integral

b) Video

- i) The definite integral
 - (1) <https://www.khanacademy.org/math/calculus-1/cs1-integrals/cs1-a-cumulations-of-change-introduction/v/definite-integrals-intro>
 - (a) includes that the definite integral = area under the curve
- ii) Reiman sum and definite integral
 - (1) <https://www.khanacademy.org/math/calculus-1/cs1-integrals/cs1-defining-integrals-with-riemann-sums/v/riemann-sums-and-integrals>
- iii) Indefinite integral
 - (1) <https://www.khanacademy.org/math/calculus-1/cs1-integrals/cs1-fundamental-theorem-of-calculus-and-definite-integrals/v/antiderivatives-and-indefinite-integrals>

c) Reading

- i) The definite integral
 - (1) <https://openstax.org/books/calculus-volume-1/pages/5-2-the-definite-integral>
 - (a) includes that the definite integral = area under the curve
- ii) The indefinite integral
 - (1) <https://openstax.org/books/calculus-volume-1/pages/4-10-antiderivatives>
 - (a) This includes a lot of things. The main thing needed now is to know what an indefinite integral is.

d) Problems

- i) Submit notes on this lesson.
- ii) I would think these should be 3-5 lines minimum. There is no need for them to be longer but you may make them longer if you find it useful.
- iii) Your notes must include
 - (1) The difference between a definite and indefinite integral
 - (2) The relationship between area under the curve and the definite integral
 - (3) The relationship between the Reiman sum and the definite integral

3) Lesson 3: Taking integrals

a) Objective

- i) Learn how to evaluate integrals
- ii) Using the power rule
- iii) Evaluating integrals with limits (definite integrals)

b) Video

i) Reverse Power Rule

- (1) <https://www.khanacademy.org/math/calculus-1/cs1-integrals/cs1-reverse-power-rule/v/indefinite-integrals-of-x-raised-to-a-power>

ii) Sums and multiples

- (1) <https://www.khanacademy.org/math/calculus-1/cs1-integrals/cs1-reverse-power-rule/v/indefinite-integral-properties>

(a) I don't think you need to watch this whole video. Just how to deal with sums and multiples.

iii) Evaluating definite integrals

- (1) <https://www.khanacademy.org/math/calculus-1/cs1-integrals/cs1-definite-integrals-of-common-functions/v/reverse-power-rule-for-definite-integrals>

c) Readings

- i) <https://openstax.org/books/calculus-volume-1/pages/5-4-integration-formulas-and-the-net-change-theorem>

d) Problems

i) On this worksheet (ws7: Indefinite integrals)

- (1) https://drive.google.com/file/d/1iWKI86tN_Wk-aU_9rOGbLZQziVo_ZkCXo/view?usp=drive_link

(2) do #1, 2, 5, 7, 13, 15

ii) On following link (definite integrals)

- (1) <https://tutorial.math.lamar.edu/Problems/CalcI/ComputingDefiniteIntegrals.aspx>

(2) Do #2-6, 9

4) Lesson 4: Application of integrals (Motion)

a) Problems

i) On the following worksheet (ws9)

- ii) https://docs.google.com/document/d/11fBxPYI_Slp1f11odjo66b69235Tu30GIFhR02KPmde/edit?usp=sharing

iii) Do #1-5, 10