

AP Physics C

Summer Homework Assignment

Welcome!

This course prepares you to take the AP C Mechanics and AP C Electricity & Magnetism exams at the end of the year. We will cover a breadth of topics ranging from Newton's Laws, Energy, and Angular Momentum, to Electrostatics, Circuits, Magnetism, and Inductors. The following tasks should be completed before the first class. There will be a low-stakes assessment the first week back that will serve as a check-in to see where you are at.

In order to complete everything on time, I would recommend doing each task in order, and in small chunks over the summer. This is meant to prepare you for the course, so we have more time to cover the more challenging topics. Every problem is graded on completion, with a scale based on effort. Please show your work and make note of confusion, or questions you may have.

Welcome to AP Physics C!

Tasks (Due at the beginning of the first class)

1. **Purchase the textbook** – (This is available as a pdf online as well)

'Fundamentals of Physics' by Halliday, Resnick, and Walker. 10th ed.
ISBN: 978-1118230718

2. Read chapters 1,2,4.
3. Read chapters 3 and 5 with a pen in hand.
4. Complete the calculus worksheets attached.
5. Solve the following textbook problems listed below. There will be a low-stakes assessment on these concepts soon after the start of classes. We will review these problems and any questions you may have, so **please make note of any confusion**.

Textbook Problems (Found at the end of each chapter under Problems, not Questions)

Chap 2: 5, 9, 14, 22.

Chap 3: 1, 5, 30

Chap 4: 7, 13

Chap 5: 3, 11, 42, 51, 86

Name : _____

Score : _____

Teacher : _____

Date : _____

Derivatives

1) $f(x) = -\frac{2}{3}x^3 - x^2$

Find $f'''(x)$

2) $y = \frac{4}{3}x^5 - x^2$

Find $\frac{d^3y}{dx^3}$

3) $f(x) = 3x^3 + \frac{1}{2}x^2$

Find $f''(x)$

4) $y = \frac{5}{2}x^4 - 6x^2$

Find $\frac{d^3y}{dx^3}$

5) $f(x) = \frac{3}{2}x^5 - 4x^2$

Find $f'''(x)$

6) $y = \frac{4}{3}x^4 - \frac{1}{2}x^3$

Find $\frac{d^2y}{dx^2}$

7) $f(x) = -5x^5 - \frac{4}{3}x^4$

Find $f''(x)$

8) $y = 5x^3 - \frac{3}{2}x^2$

Find $\frac{d^2y}{dx^2}$



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Derivatives

1) $f(x) = -\frac{2}{3}x^3 - x^2$

Find $f'''(x)$

-4

2) $y = \frac{4}{3}x^5 - x^2$

Find $\frac{d^3y}{dx^3}$

$80x^2$

3) $f(x) = 3x^3 + \frac{1}{2}x^2$

Find $f''(x)$

$18x +$

4) $y = \frac{5}{2}x^4 - 6x^2$

Find $\frac{d^3y}{dx^3}$

$60x$

5) $f(x) = \frac{3}{2}x^5 - 4x^2$

Find $f'''(x)$

$90x^2$

6) $y = \frac{4}{3}x^4 - \frac{1}{2}x^3$

Find $\frac{d^2y}{dx^2}$

$16x^2 - 3x$

7) $f(x) = -5x^5 - \frac{4}{3}x^4$

Find $f''(x)$

$-100x^3 - 16x^2$

8) $y = 5x^3 - \frac{3}{2}x^2$

Find $\frac{d^2y}{dx^2}$

$30x - 3$



Name : _____

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Power, Constant, and Sum Rules

Differentiate each function with respect to the given variable.

1) $y = x^2 - 8x + 7$

2) $y = -x^3 + 5x^2 + 18x - 72$

3) $y = \frac{11}{x^4}$

4) $y = \frac{7}{x^3}$

5) $y = x^2 + x$

6) $y = \frac{20}{x}$

7) $y = \frac{-9}{x^5}$

8) $y = x^3 - 3x^2 - 18x + 40$

9) $y = x^2 + 2x - 24$

10) $y = \frac{18}{x^4}$



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Score : _____

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Date : _____

Power, Constant, and Sum Rules

Differentiate each function with respect to the given variable.

1) $y = x^2 - 8x + 7$

$$\frac{dy}{dx} = 2x - 8$$

2) $y = -x^3 + 5x^2 + 18x - 72$

$$\frac{dy}{dx} = -3x^2 + 10x + 18$$

3) $y = \frac{11}{x^4}$

$$\frac{dy}{dx} = \frac{-44}{x^5}$$

4) $y = \frac{7}{x^3}$

$$\frac{dy}{dx} = \frac{-21}{x^4}$$

5) $y = x^2 + x$

$$\frac{dy}{dx} = 2x + 1$$

6) $y = \frac{20}{x}$

$$\frac{dy}{dx} = \frac{-20}{x^2}$$

7) $y = \frac{-9}{x^5}$

$$\frac{dy}{dx} = \frac{45}{x^6}$$

8) $y = x^3 - 3x^2 - 18x + 40$

$$\frac{dy}{dx} = 3x^2 - 6x - 18$$

9) $y = x^2 + 2x - 24$

$$\frac{dy}{dx} = 2x + 2$$

10) $y = \frac{18}{x^4}$

$$\frac{dy}{dx} = \frac{-72}{x^5}$$

