

Unit 6 - End of Unit Review

Calc. AB/BC

Warmup: Questions from Lesson 6.14?

If you haven't finished the CA worksheet from yesterday take it out and continue to work on it during this time.

Name: _____ Date: _____ Period: _____

Review

End-of-Unit 6 Review – Integration and Accumulation of Change

Lessons 6.6 through 6.14

Reviews do NOT cover all material from the lessons but will hopefully remind you of key points. To be prepared, you must study all packets from Unit 6.

Find the value of the definite integral.

1. $\int_{-2}^{-1} \left(\frac{1}{x^2} + x^2 - 5x \right) dx$

2. $\int_{-1}^8 (x^{2/3} - x) dx$

3. $\int_0^{\pi} (x - \sin x) dx$

4. $\int_{-1}^1 x\sqrt{1-x^2}dx$	5. $\int_0^{\frac{\pi}{6}} \frac{\sin(2x)}{\cos^2(2x)} dx$	6. $\int_e^{e^2} \frac{1}{x \ln x} dx$
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7. If $\int_{-5}^2 f(x)dx = -17$ and $\int_5^2 f(x)dx = 4$, what is the value of $\int_{-5}^5 f(x)dx$?

(A) -21

(B) -13

(C) 0

(D) 13

(E) 21

Find the following indefinite integrals.

8. $\int \left(\frac{x^2 - x + 5}{x} \right) dx$

9. $\int \sec x \tan x \, dx$

10. $\int \frac{2x}{3} \ln 4x \, dx$

11. $\int \sqrt{x} \left(x - \frac{4}{x} \right) dx$

$$12. \int \frac{50x^3 - 55x^2 - 26x + 33}{10x - 7} dx$$

$$13. \int_0^6 \frac{1}{\sqrt{6-x}} dx$$

14. $\int (e^x + 2^x) dx$

15. $\int \left(\frac{1}{x} + \frac{1}{x^3} \right) dx$

16. $\int x^2 e^x dx$

17. $\int \frac{1}{x^2 + 6x + 8} dx$

18. $\int_0^{\infty} \frac{1}{9+x^2} dx$

19. $\int \frac{1}{x^2+2x+2} dx$

20. **Calculator active problem.** If $f'(x) = \sin(e^x)$ and $f(0) = 5.7$, then $f(2) =$

Notes Filled In:

[AP Calc. AB/BC - Unit 6 Review - Filled In](#)

Practice - Test Prep.

Take the next 5-10 minutes to work together on the practice - test prep section of our notes.

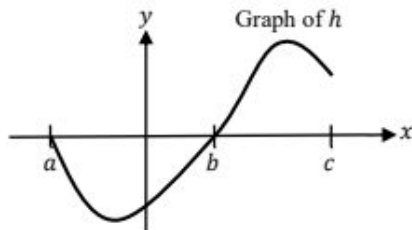
We will go through it together on the board after the time is up!

Name: _____ Date: _____

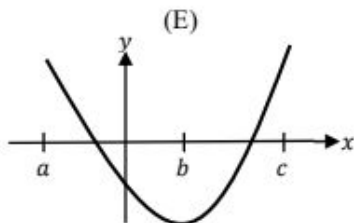
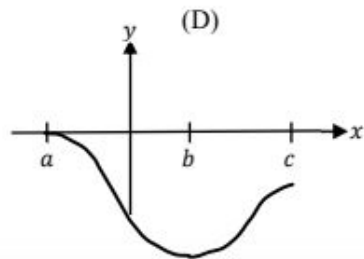
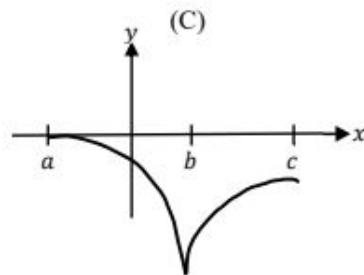
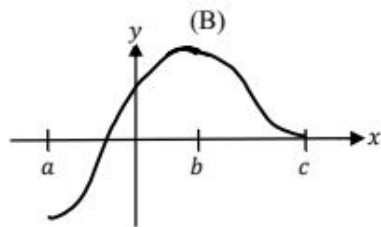
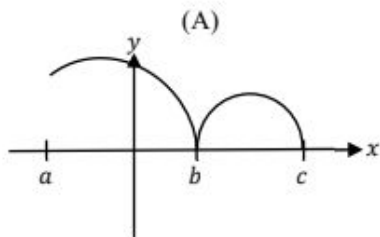
Corrective Assignment

End of Unit 6 CA – Integration and Accumulation of Change

1. Let $f(x) = \int_a^x h(t) dt$, where h has the graph shown below.

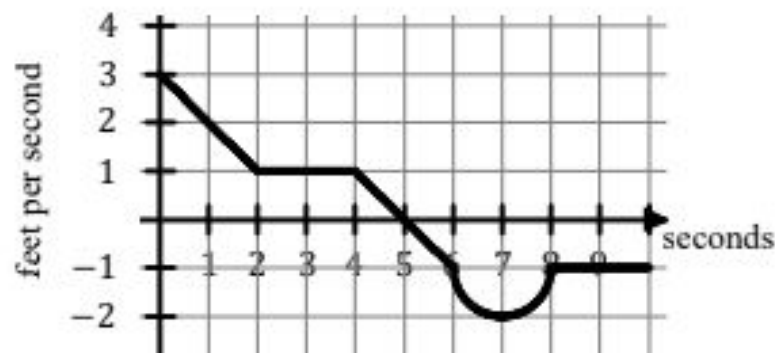


Which of the following could be the graph of f ?

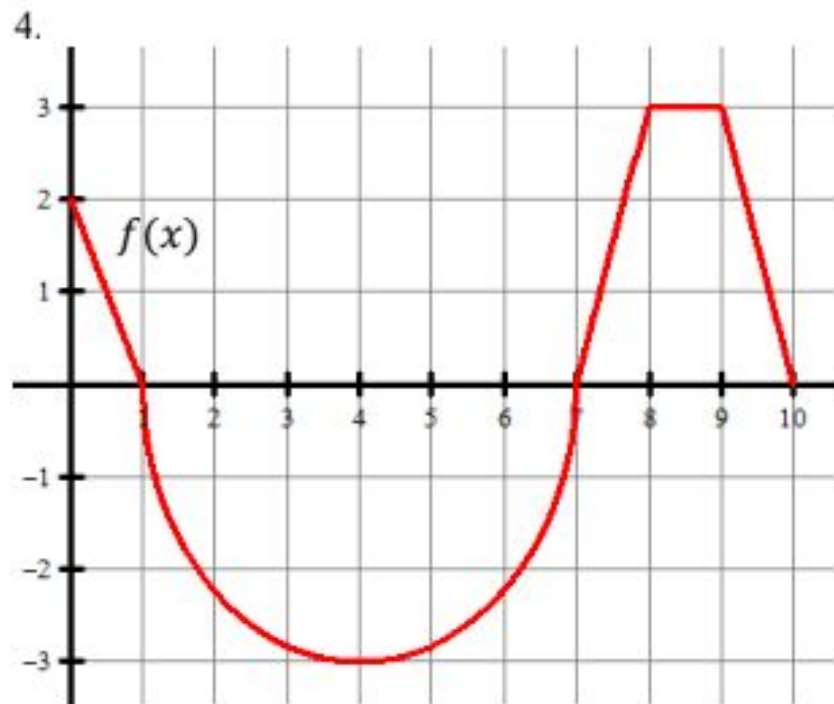


2. Let f and g be continuous functions such that $\int_0^{10} f(x) dx = 21$, $\int_0^{10} \frac{1}{2}g(x) dx = 8$, and $\int_3^{10} (f(x) - g(x)) dx = 2$. What is the value of $\int_0^3 (f(x) - g(x)) dx$?

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3. The graph below shows the velocity of a particle moving along the y -axis, measured in feet per second.



How far is the particle from its starting position after 10 seconds?



$$(a) \int_0^1 2f(x)dx =$$

$$(b) \int_1^7 f(x)dx =$$

$$(c) \int_0^7 f(x)dx =$$

$$(d) \int_{10}^7 f(x)dx =$$

$$(e) \int_8^7 f(x)dx =$$

$$(f) \int_0^{10} f(x)dx =$$

Find the value of the definite integral.

5. $\int_2^3 \left(\frac{1}{x^2} + 4x^3 \right) dx$

6. $\int_{-1}^8 x^{2/3} dx$

7. $\int_0^1 x\sqrt{1-x^2} dx$

8. $\int_{-1}^0 \frac{x}{x^2+1} dx$

9. $\int_0^1 \frac{y^2+2y}{\sqrt[3]{y^3+3y^2+4}} dy$

10. If $\int_4^{-10} g(x) \, dx = -3$ and $\int_4^6 g(x) \, dx = -2$, find $\int_{-10}^6 g(x) \, dx =$

11. $\int_0^{e-1} \frac{4}{x+1} \, dx$

(A) 4

(B) $4e$

(C) 0

(D) $-4e$

(E) -4

12. $\int \sin(2x) \cos(2x) dx$

(A) $\frac{1}{2} \sin^2(2x) + C$

(B) $-\frac{1}{2} \cos^2(2x) + C$

(C) $\frac{1}{4} \sin^2(2x) + C$

(D) $\frac{1}{4} \cos^2(2x) + C$

(E) $\frac{1}{2} \sin^2(2x) \cos(2x) + C$

13. **Calculator active problem.** The table below contains values of a continuous increasing function f at several values of x .

x	1	3	7	10	12	15
$f(x)$	0.14	0.21	0.28	0.36	0.44	0.54

- a. Use a left endpoint Riemann sum with three subintervals to approximate $\int_3^{12} f(x) dx$.
- b. Is your approximation an overestimate or underestimate of the true value? Explain why.

Find the following indefinite integrals.

14. $\int \left(\frac{8x^2 + 3x - 6}{x} \right) dx$

15. $\int \frac{1}{x\sqrt{x}} dx$

16. $\int \sec^2 x \, dx$

17. $\int \frac{e^{2x}}{e^{2x} + 1} dx$

18. $\int \frac{x^3 - \sqrt{x}}{\sqrt{x}} dx$

19. $\int x^3 \cos(x^4) dx$

20. $\int \frac{14x^2 - 29x - 69}{2x - 7} dx$

21. $\int \frac{1}{\sqrt{-x^2 + 6x - 8}} dx$

$$22. \int 4x \ln 3x \, dx$$

$$23. \int 3x^2 e^x dx$$

$$24. \int_2^4 \frac{3x}{(x-1)(x+3)} \, dx$$

$$25. \int \frac{2x-3}{x^3+5x^2+6x} \, dx$$

26. $\int_{-\infty}^0 \frac{1}{(2x-1)^3} dx$

27. $\int_0^1 \frac{1}{\sqrt{1-x^2}} dx$

28. $\int_0^{\infty} e^{-2x} dx$

29. If $f'(x) = 8x^3 + 1$ and $f(1) = 5$, then $f(2) =$

30. **Calculator active problem.** If $f'(x) = e^{\cos x}$ and $f(-1) = 3.31$, then $f(0) =$

Answers

1. D	2. 3	3. $2 - \frac{\pi}{2}$	4a. 2 4b. $-\frac{9\pi}{2}$ 4c. $1 - \frac{9\pi}{2}$	4d. -6 4e. 0 4f. $7 - \frac{9\pi}{2}$	
5. $65\frac{1}{6} = \frac{391}{6}$	6. $\frac{99}{5}$	7. $\frac{1}{3}$	8. $\ln\left(\frac{1}{\sqrt{2}}\right)$	9. $2 - \frac{1}{2}\sqrt[3]{16}$	10. 1
11. 4	12. C	13. 2.4	13b. Underestimate because it is a Left Riemann Sum with an increasing function.		
14. $4x^2 + 3x - 6\ln x + C$		15. $-\frac{2}{\sqrt{x}} + C$		16. $\tan x + C$	
17. $\frac{1}{2}\ln e^{2x} + 1 + C$		18. $\frac{2}{7}x^{\frac{7}{2}} - x + C$		19. $\frac{1}{4}\sin(x^4) + C$	
20. $\frac{7}{2}x^2 + 10x + \frac{1}{2}\ln 2x - 7 + C$		21. $\sin^{-1}(x - 3) + C$		22. $2x^2 \ln 3x - x^2 + C$	
23. $3x^2e^x - 6xe^x + 6e^x + C$			24. $\frac{3}{4}\ln 3 + \frac{9}{4}\ln\frac{7}{5}$		
25. $-\frac{1}{2}\ln x + 3\ln x + 3 + \frac{7}{2}\ln x + 2 + C$			26. $-\frac{1}{4}$		27. $\frac{\pi}{2}$
28. $\frac{1}{2}$		29. 36		30. 5.6515	