

Name _____ Per _____ Date _____

Unit 5 – Integral Review #2

Do NOT Use a Calculator

1. $\int_1^2 (4x^3 - 6x) dx$

- a) 2 b) 4 c) 6 d) 36 e) 42

2. $\int_1^2 \frac{1}{x^3} dx$

- a) $-\frac{7}{8}$ b) $-\frac{3}{4}$ c) $\frac{15}{64}$ d) $\frac{3}{8}$ e) $\frac{15}{16}$

3. $\int_0^1 x(x^2 + 2)^2 dx$

- a) $\frac{19}{2}$ b) $\frac{19}{3}$ c) $\frac{9}{2}$ d) $\frac{19}{6}$ e) $\frac{1}{6}$

4. $\int \sin(2x + 3) dx$

- a) $-2 \cos(2x + 3) + C$ b) $-\cos(2x + 3) + C$ c) $-\frac{1}{2} \cos(2x + 3) + C$
d) $\frac{1}{2} \cos(2x + 3) + C$ e) $\cos(2x + 3) + C$

5. $\int \frac{x}{\sqrt{3x^2 + 5}} dx$

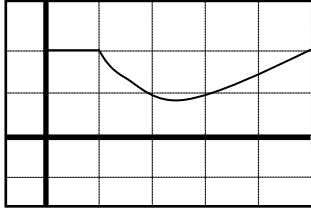
- a) $\frac{1}{9}(3x^2 + 5)^{\frac{3}{2}} + C$ b) $\frac{1}{4}(3x^2 + 5)^{\frac{3}{2}} + C$ c) $\frac{1}{12}(3x^2 + 5)^{\frac{1}{2}} + C$
d) $\frac{1}{3}(3x^2 + 5)^{\frac{1}{2}} + C$ e) $\frac{3}{2}(3x^2 + 5)^{\frac{1}{2}} + C$

6. $\int_0^5 \frac{dx}{\sqrt{1 + 3x}}$

- a) 4 b) $\frac{8}{3}$ c) 2 d) $\frac{16}{9}$ e) 1

7. Find all possible values of k if $\int_{-3}^k x^2 dx = 0$.

- a) -3 b) 0 c) 3 d) -3, 3 e) -3, 0, 3



8. The graph of f is shown above. If $\int_1^3 f(x)dx = 2.3$ and $F'(x) = f(x)$, the $F(3) - F(0) = ?$

- a) 0.3 b) 1.3 c) 3.3 d) 4.3 e) 5.3

9. $\int_1^4 |x-3| dx$

- a) -3/2 b) 3/2 c) 5/2 d) 9/2 e) 5

10. If $\sqrt{(f(x))^2} = |f(x)|$, then find the value of $\int_{-\pi/2}^{\pi} (\sqrt{\sin^2 x}) dx$

- a) 3/2 b) 1 c) 3 d) 2 e) 7/2

11. If $\int_2^4 f(x)dx = 6$ then $\int_2^4 [f(x) + 3]dx = ?$

- a) 3 b) 6 c) 9 d) 12 e) 15

12. Let $f(x)$ be a function defined by $f(x) = \begin{cases} x^2 + 4 & 0 \leq x \leq 1 \\ 6 - x & \text{everywhere else} \end{cases}$

the value of $\int_0^3 f(x)dx$ is a number between:

- a) 0 and 5 b) 5 and 10 c) 10 and 15 d) 15 and 20 e) 20 and 25

13. $\int \sec x \tan x dx =$

- a) $\tan x + C$ b) $\sin x + C$ c) $\sec x + C$ d) $\sec^2 x + C$ e) $\tan^2 x + C$

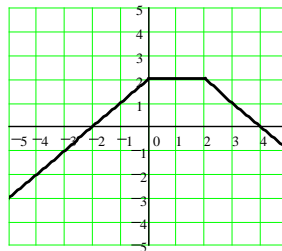
14. Suppose that f and g are continuous and that

$$\int_1^2 f(x) dx = -4, \quad \int_1^5 f(x) dx = 6, \quad \int_1^5 g(x) dx = 8.$$

Find:

- a) $\int_2^5 g(x) dx$ b) $\int_5^1 g(x) dx$
 c) $\int_1^2 3f(x) dx$ d) $\int_2^5 f(x) dx$
 e) $\int_1^5 [f(x) - g(x)] dx$ f) $\int_1^5 [4f(x) - g(x)] dx$

15. If $f(x)$ has the following graph find $\int_{-3}^4 f(x) dx$



16. Given $5x^3 + 40 = \int_a^x f(t) dt$. The value of a is?

- a) -2 b) 2 c) 1 d) -1 e) 0

17. Suppose $G(x) = \int_0^{2x} \cos(t^2) dt$ for all real x . Then $G'(\sqrt{\pi}) = ?$

- a) 2 b) 1 c) 0 d) -1 e) -2

18. Consider the function F defined so that $F(x) + 5 = \int_2^x \sin\left(\frac{\pi t}{4}\right) dt$. The value of $F(2) + F'(2)$ is?

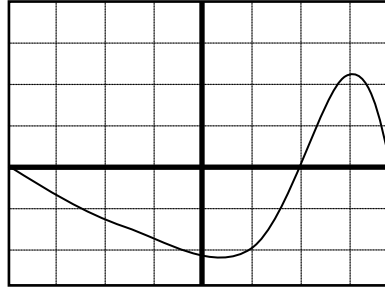
- a) 0 b) 1 c) $\frac{\pi}{4}$ d) 4 e) -4

19. If f and g are continuous functions such that $g'(x) = f(x)$ for all x , then $\int_2^3 f(x) dx =$
- a) $g'(2) - g'(3)$ b) $g'(3) - g'(2)$ c) $f'(3) - f'(2)$ d) $g(3) - g(2)$ e) $f(3) - f(2)$

20. The graph of the function f is shown.

If $G(x) = \int_{-4}^x f(t) dt$ for $[-4, 4]$ which are true?

- I. G is increasing on $(1, 2)$
 II. G is decreasing on $(-4, -3)$
 III. $G(0) < 0$



- a) none b) II c) III
 d) II and III e) I and II

21. Approximate $\int_0^2 x^3 dx$ by using 4 subintervals of equal width and calculating:

- a) The left Sum b) The right sum
 c) The midpoint sum d) the integral

$$22. \frac{d}{dx} \left(\int_x^{x^2} \cos(3t) dt \right) =$$

23. An ice cream shop sells ice cream at a rate of $C(x) = 90x^3 - 3x^2 + 2$ scoops per hour over the course of the day. How many scoops have they sold after being open 2 hours?

Answers: 1) C 2) D 3) D 4) C 5) D 6) C 7) A 8) D 9) C 10) C 11) D 12) C 13) C 14) a) 0
 b) -8 c) -12 d) 10 e) -2 f) 16 15) 7.5 16) A 17) A 18) E 19) D 20) D
 21) a) 9/4 b) 25/4 c) 31/8 d) 4 22) $2x \cos(3x^2) - \cos(3x)$ 23) 356 scoops