

**My Big Integral Review [Skills only]**

*In the following problems,  $a$  and  $b$  are real numbers*

1.  $\int h'(x) dx$

2.  $\int_a^a h'(x) dx$

3.  $\int_a^b h'(x) dx$

4.  $\int h''(x) dx$

5.  $\int_a^b h''(x) dx$

6.  $\int_a^b h'(x+2) dx$

7.  $\int \cos(3x) dx$

8.  $\int \frac{\cos \sqrt{x}}{\sqrt{x}} dx$

9.  $\int (-\sin x)(\sqrt{\cos x}) dx$

10.  $\int \sin x \cos x dx$

11.  $\int \frac{\cos x}{\sin x} dx$

12.  $\int e^{\sin x} \cos x dx$

13.  $\int \cos(37x) \sin(37x) dx$

$$14. \int (\tan^8 x)(\sec^2 x) dx$$

$$15. \int \sqrt{x}(x^7 + x^3) dx$$

$$16. \int \frac{x^3 + 5x^2 + x + 7}{x} dx$$

$$17. \int \sqrt{x^4 + x^2 + 1} (4x^3 + 2x) dx$$

$$18. \frac{d}{dx} \int_3^x \ln(t^2 + 5) dt$$

$$19. \frac{d}{dx} \int_5^{x^2} \ln(t^2 + 7) dt$$

$$20. \int_0^{\pi} \cos(2\theta) d\theta$$

$$21. \frac{1}{2} \int e^{\frac{t}{2}} dt$$

$$22. \int_0^{\frac{\pi}{4}} \frac{e^{\tan x}}{\cos^2 x} dx$$

$$23. \int_2^4 \frac{1}{x^2} dx$$

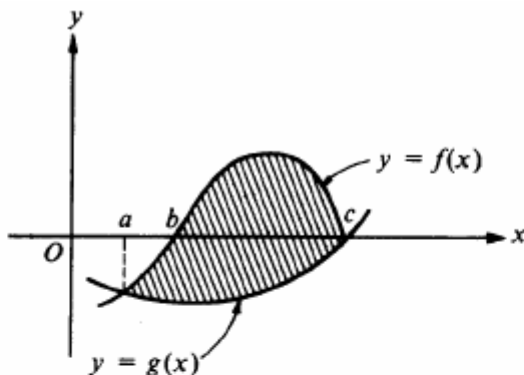
$$24. \int_1^e \left( \frac{x^2 - 1}{x} \right) dx$$

$$25. \text{ If } f \text{ is a linear function and } 0 < a < b, \text{ then } \int_a^b f''(x) dx =$$

26. If  $F(x) = \int_0^x \sqrt{t^3 + 1} dt$ , then  $F'(2) =$

27. What are all values of  $k$  for which  $\int_{-3}^k x^2 dx = 0$

28.



The area of the shaded region in the figure above is represented by which of the following integrals?

(A)  $\int_a^c (|f(x)| - |g(x)|) dx$

(B)  $\int_b^c f(x) dx - \int_a^c g(x) dx$

(C)  $\int_a^c (g(x) - f(x)) dx$

(D)  $\int_a^c (f(x) - g(x)) dx$

(E)  $\int_a^b (g(x) - f(x)) dx + \int_b^c (f(x) - g(x)) dx$