BRITISH COLUMBIA CALCULUS 12 (MCALC12) · UNIT D · 25 QUESTIONS

Integration and Applications — Practice Test

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, use the Flag a mistake button to let Brett know so he can fix it.

1 $\int 3x^2\,dx$ is



A $x^3 + C$

B $3x^3 + C$

C $\frac{x^3}{3} + C$

D $6x + C$

Understand It with Pulse

Flag a mistake

2 $\int (2x + 3)\, dx$ is

- **A** $x^2 + 3x + C$
- **B** $2x^2 + 3x + C$
- **C** $x^2 + 3 + C$
- **D** $x^2 - 3x + C$

Understand It with Pulse | Flag a mistake

3 $\int \cos x\, dx$ is

- **A** $-\sin x + C$
- **B** $\sin x + C$
- **C** $\cos x + C$
- **D** $-\cos x + C$

Understand It with Pulse | Flag a mistake

4 $\int e^{3x}\,dx$ is

A $e^{3x} + C$

B $3e^{3x} + C$

C $\frac{1}{3}e^{3x} + C$

D $e^{x} + C$

Understand It with Pulse | Flag a mistake

5 $\int \frac{1}{x} dx$ is



A $\ln |x| + C$

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

C $\frac{1}{x^2} + C$

D $x + C$

Understand It with Pulse | Flag a mistake

6 $\int_0^2 x\,dx$ is

A 1

B 2

C 4

D 0

Understand It with Pulse | Flag a mistake

7 $\int_1^3 2x\,dx$ is

A 4

B 6

C 8

D 10

Understand It with Pulse | Flag a mistake

8 $\int_0^{\pi/2} \cos x \, dx$ is



A 0

B -1

C $\frac{\pi}{2}$

D 1

Understand It with Pulse | Flag a mistake

9 $\int_{-1}^{1} x^2\,dx$ is

- **A** $\frac{1}{3}$
- **B** 0
- **C** $\frac{2}{3}$
- **D** 2

Understand It with Pulse | Flag a mistake

10 $\frac{d}{dx}\int_{0}^{x} t^2\,dt$ is

- **A** 2x
- **B** x^2
- **C** $\frac{x^3}{3}$
- **D** x

Understand It with Pulse | Flag a mistake

11 $\frac{d}{dx} \int_0^{x^2} t^2 \, dt$ is

A x^4

B $2x^5$

C x^5

D $2x^3$

Understand It with Pulse | Flag a mistake

12 If F'(x) = f(x), F(2) = 5, and F(5) = 11, then $\int_2^5 f(x) \, dx$ is

A 16

B 6

C -6

D 55

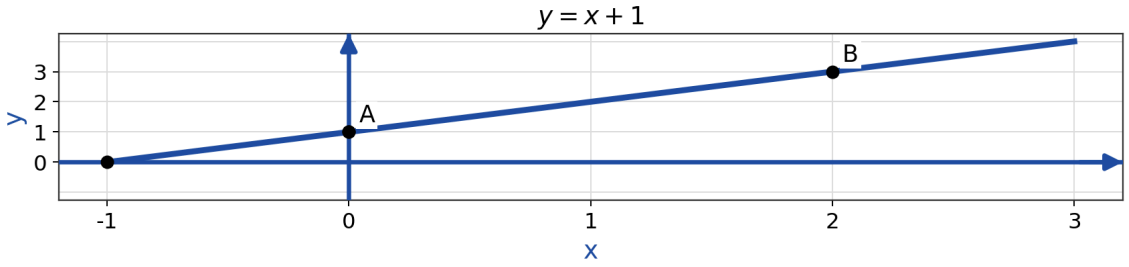
Understand It with Pulse | Flag a mistake

13 **The area under y = x + 1 from x = 0 to x = 2 is**

- **A** 3
- **B** 5
- **C** 6
- **D** 4

Understand It with Pulse | Flag a mistake

14 **The graph shows y = x + 1. The area under the curve from x = 0 to x = 2 is**



- **A** 2
- **B** 4
- **C** 6
- **D** 3

Understand It with Pulse | Flag a mistake

15 The area between $y = x$ and $y = x^2$ from $x = 0$ to $x = 1$ is

A $\frac{1}{6}$

B $\frac{1}{3}$

C $\frac{1}{2}$

D $\frac{2}{3}$

Understand It with Pulse | Flag a mistake

16 The area between $y = 4 - x^2$ and the x-axis is



A $\frac{16}{3}$

B 16

C $\frac{8}{3}$

D $\frac{32}{3}$

Understand It with Pulse | Flag a mistake

17 **The volume formed by rotating $y = x$, $0 \le x \le 2$, about the x-axis is**



A $\frac{4\pi}{3}$

B $\frac{8\pi}{3}$

C 4π

D 8π

Understand It with Pulse

Flag a mistake

18 The volume formed by rotating $y = \sqrt{x}$, $0 \le x \le 4$, about the x-axis is

- A 4π
- B 8π
- C 16π
- D 2π

Understand It with Pulse | Flag a mistake

19 The volume formed by rotating $y = 3$, $0 \le x \le 2$, about the x-axis is

- A 9π
- B 6π
- C 18π
- D 36π

Understand It with Pulse | Flag a mistake

20 $\int_{-2}^{0} x\,dx$ is

A 2

B -2

C 0

D 4

Understand It with Pulse | Flag a mistake

21 $\int x^{-2}\,dx$ is

A $-\frac{1}{x} + C$

B $\frac{1}{x} + C$

C $-2x^{-3} + C$

D $x^{-1} + C$

Understand It with Pulse | Flag a mistake

22 $\int_0^1 (x+1)^2\,dx$ is

A $\frac{7}{3}$

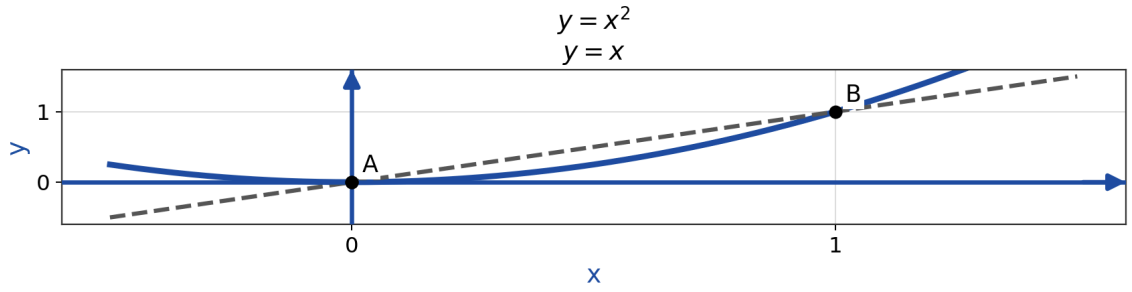
B $\frac{8}{3}$

C 3

D $\frac{5}{3}$

Understand It with Pulse | Flag a mistake

23 **The graph shows $y = x^2$ and $y = x$. The area between them from $x = 0$ to $x = 1$ is**



A $\frac{1}{3}$

B $\frac{1}{2}$

C $\frac{5}{6}$

D $\frac{1}{6}$

Understand It with Pulse | Flag a mistake

24 The volume formed by rotating the region between $y = x$ and $y = x^2$, $0 \le x \le 1$, about the x-axis is

A $\frac{2\pi}{15}$

B $\frac{\pi}{15}$

C $\frac{\pi}{3}$

D $\frac{4\pi}{15}$

Understand It with Pulse | Flag a mistake

25 If $\int_0^3 f(x)\,dx = 4$ and $\int_3^5 f(x)\,dx = -1$, then $\int_0^5 f(x)\,dx$ is

A 5

B 3

C -3

D 4

Understand It with Pulse | Flag a mistake

ANSWER KEY

1.	A	**10.**	B	**19.**	C
2.	A	**11.**	B	**20.**	B
3.	B	**12.**	B	**21.**	A
4.	C	**13.**	D	**22.**	A
5.	A	**14.**	B	**23.**	D
6.	B	**15.**	A	**24.**	A
7.	C	**16.**	D	**25.**	B
8.	D	**17.**	B		
9.	C	**18.**	B		

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