

Calculus Pre-Test (22 questions) Level A

Part 1: Pre-Calculus

Print final results only

1. $\sin^2 \theta + \cos^2 \theta =$

2. $\frac{1 - \cos 2a}{2} =$

3. $\ln 8 + \ln 7 = \ln$ _____

4. *Simplify:* $6x^2 + 24x + 18$

6 Points

10. $\frac{d}{dx} (\tan x)$

30 Points

11. $\frac{d}{dx} \left(\frac{x}{x^2+1} \right)$

Part 2: Limits and Continuity

Print results only, except Q8.

5. $\lim_{x \rightarrow 2} \frac{x+2}{x^2-4} =$

6. $\lim_{x \rightarrow 0} \frac{3 \sin 6x}{x} =$

7. $\lim_{x \rightarrow 0^+} \ln x =$

8. *Prove or disapprove:* $y = x + 8$ is continuous.

12 Points

12. $\frac{d}{dx} \cos(x^2 + 4)$

13. $\frac{d}{dx} \sqrt{x^4 - 9}x$

Part 3: Differentiation and Derivatives

Show necessary steps for full credits.

9. $\frac{d}{dx} \sqrt{3x}$

14. If $f(x) = 2x^4$. $f^8(x) =$ _____

Part 4: Indefinite Integrals

Show necessary steps for full credits.

15. $\int \frac{3x-7}{x^2-5x+6} dx$

25 Points

Part 5: Definite Integrals

Show necessary steps for full credits.

20. $\int_{-5}^3 |x| dx$

7 Points

16. $\int \ln x dx$

Part 6: Applications

20 Points

21. Find the area A between $y_1 = x^2$ and $y_2 = x^3$.

17. $\int (2x + 7)^4 dx$

18. $\int e^{3x} dx$

22. Suppose we are trying to build a pigpen that maximizes the area the little piggy may enjoy, but only have a wall of *unlimited* length and fences of 100 meters. What is the maximum area of the playground we could build for the little piggy?



19. $\int \sin^2 x \cos x dx$