

- Print Name, ID number and Section on your blue book.
- BOOKS and CALCULATORS are NOT allowed.
One sheet of NOTES is allowed.
- **You must show your work to receive credit.**

1. (6 points each) Evaluate the following. Remember to show your work!

(a) $\frac{d}{dx} \int_{-x}^{2x} \sqrt{u^3 + 1} du.$

(b) $\int \arcsin x dx.$

(c) $\int_0^{\pi/2} \cos^3 x dx.$

(d) $\int_0^1 (3x - 1)^4 dx.$

2. (5 points) Verify that $\int (\cos(\ln x) + \sin(\ln x)) dx = x \sin(\ln x) + C.$

3. (6 points) Find the *area* enclosed between the x -axis and the curve

$$y = x(x - 1)(x + 2) = x^3 + x^2 - 2x.$$

If fractions appear in your answer, you need not add them up. For example, if it were correct, you could leave your answer as $\frac{1}{4} + \frac{7}{3} - 1.$

Note: A sketch may be useful in obtaining partial credit if you make a mistake.

4. (5 points) The region that is below the curve $x = y^2$ and above the curve $y = x^2$ is rotated about the line $y = -2.$ Write an integral for the volume of the solid obtained. **DO NOT EVALUATE** the integral.

Note: A sketch may be useful in obtaining partial credit if you make a mistake.