Name: ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯   **Section:** ⎯⎯⎯⎯⎯⎯⎯

You have 20 minutes to complete the following problems, without using your notes, book, or calculator.

Part 1: Trigonometry

1. Fill in the following table, using the five standard angles in the first quadrant.

Angle, θ		$\sin\theta$	$\cos\theta$	$\tan\theta$
deg	rad			

2. State the three Pythagorean Trig Identities:

    (a)

    (b)

    (c)

3. $\cos(270°) = $ ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

4. $\cot\left(-\dfrac{5\pi}{6}\right) = $ ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

Part 2: Derivatives

5. Differentiate.

   (a) $\frac{d}{dx}\ 3x^7 - x^5 + x^{-1}\ =$ _____

   (b) $\frac{d}{dx}\ 2\sec x\ =$ _____

   (c) $\frac{d}{dx}\ \arcsin(x)\ =$ _____

   (d) $\frac{d}{dx}\ 2^x - 2^\pi\ =$ _____

6. Find the derivative, without simplifying afterward, and write your answer in the space provided.

   (a) $f(x)\ =\ x^8 e^{5x}$

   $f'(x)\ =$ _____

   (b) $g(t)\ =\ \dfrac{\ln t}{2t - 1}$

   $g'(t)\ =$ _____

   (c) $y = \arctan(x^2)$

   $\dfrac{dy}{dx}\ =$ _____

Part 3: Antiderivatives

7. Find an antiderivative for the given function.

   (a) $f(x) = \sec^2 x$

   (b) $J(s) = \dfrac{1}{s\sqrt{s^2 - 1}}$

   (c) $Q(t) = \dfrac{t^2 - t + 1}{t^2}$

8. Evaluate the indefinite integrals:

   (a) $\int x^3 - x^{-3}\, dx$

   (b) $\int \cos(w) + \cos(\pi)\, dw$

   (c) $\int \sqrt{t}(t - 1)\, dt$

Part 4: Definite integrals and substitution

9. Find the signed area between the curve $y = \sqrt{x}$ and the x-axis from $x = 0$ to $x = 4$.

10. Evaluate the indefinite integrals:

    (a) $\int 2x \sqrt[3]{x^2 + 1} \, dx$

    (b) $\int t^4 \sin(t^5) \, dt$

    (c) $\int \cos^3 \theta \, \sin \theta \, d\theta$

    (d) $\int \dfrac{w}{1 - w} \, dw$