

# Calculus Review Problems

Calculus and Linear Algebra II

Spring 2020

1. Let  $f(x) = x^4 - 3x^2 + 5$ . Calculate  $f'(x)$ .
2. Let  $g(\theta) = e^{\sin(2\theta)}$ . Calculate  $g'(\theta)$ .
3. Let  $h(t) = \frac{t}{1-t^2}$ . Calculate  $h'(t)$ .
4. Let  $y = 4 \sin^2 x$ . What is the slope of the tangent line at  $(\pi/6, 1)$ ?
5. Let  $y = \sqrt{1 + 4 \sin x}$ . What is the slope of the tangent line at  $(0, 1)$ ?
6. Calculate  $\int_1^2 8x^3 + 3x^2 \, dx$ .
7. Calculate  $\int_0^1 x^2 \cos(x^3) \, dx$ .
8. Calculate  $\int_1^e \frac{\ln x}{x} \, dx$ .
9. Calculate  $\int x \cos(5x) \, dx$ .
10. Calculate  $\int (\ln x)^2 \, dx$ .