

Final Exam Review: Worksheet 4

1. Find the area between the curves $y = 1 + x^2$ and $y = 3 + x$.
2. Find the area between the curves $y = 9 - \frac{x^2}{4}$ and $y = 6 - x$.
3. Find the area of the region in Quadrant I bounded by the curves $y = x^2$, $y = 2 - x$, and $y = 0$.
4. Find the area between the curves $y = x^2 - 2$ and $y = x$.
5. For each of the relationships below, find $\frac{dy}{dx}$:

(a). $y = \cos(\sqrt{x})$.

(b). $x^3 + y^3 = 4$.

(c). $y = x^{-1/6} \sin(7\pi x)$.

(d). $y = \sin(3x + 4y)$.

(e). $x = \sqrt{x^2 + y^2}$.

(f). $y = \tan(3x) \sec\left(\frac{1}{x}\right)$.

(g). $\sqrt{x} = \cos y + \sin x$.

6. $\int x \cos(3x^2 + 5) dx$

7. $\int 2x\sqrt{1+x^2} dx$

8. $\int \frac{\sin\sqrt{x}}{\sqrt{x}} dx$

9. $\int \sin(2x) \cos(2x) dx$

10. $\int \sin(3x) \cos^9(3x) dx$