

CALCULUS I – Worksheet #40

For problems 1–4 find all vertical and horizontal asymptotes, holes, x– and y–intercepts, and sketch the curve.

1. $y = \frac{x^2 + 2}{x^2 - x}$	2. $y = \frac{x^2 + 4x + 4}{x^2 + 5x + 6}$
3. $y = \frac{6x^2 + 13x - 5}{2x^2 - 3x - 2}$	4. $y = \frac{x^2 + 1}{x^2 - 2x}$

For 5 – 9, find $\frac{dF}{dx}$

5. $F(x) = \int_0^x \sqrt{1+t^2} dt =$	6. $F(x) = \int_1^x \frac{dt}{t} =$
7. $F(x) = \int_x^1 \sqrt{1-t^2} dt =$	8. $F(x) = \int_0^x \frac{dt}{1+t^2} =$
9. $F(x) = \int_1^{2x} \cos t^2 dt =$	10. $\frac{d}{dx} \left(\int_1^{x^2} \frac{dt}{1 + \sqrt{1-t}} \right) =$

11. Determine the interval(s) where the curve $y = 4x^3 - x^4$ is concave up.

12. Find the maximum value of $f(x) = 4x^3 - 8x^2 + 5x$ on $[0,2]$.

13. Find the volume if the area bounded by $y = \sin x$, $y = 0$, $x = 0$, and $x = \delta$ is revolved around the y-axis.