4.2 Optimization

Name: Date:

P 5. Find the global maximum and minimum for

$$f(x) = x^4 - 8x^2$$

on $-1 \leq x \leq 3$.

P 7. Find the global maximum and minimum for

$$f(x) = 3x^{1/3} - x$$

on $-1 \leq x \leq 8$.

P 9. Find the global maximum and minimum for

$$f(x) = x^2 - 2|x|$$

on $-3 \leq x \leq 4$.

P 13. Find the value(s) of x for which:

(a) $f(x)$ has a local maximum or local minimum. Indicate which ones are maxima and which are minima.

(b) $f(x)$ has a global maximum or global minimum.

where $f(x) = \sin^2 x - \cos x$ on $0 \leq x \leq \pi$.

P 18. Find the exact global maximum and minimum values of the function. The domain is all real numbers unless otherwise specified.

$$f(t) = \frac{t}{1 + t^2}$$

P 23. Find the best possible bounds for $x + \sin x$ on $0 \le x \le 2\pi$.

P 23. Find the best possible bounds for $\ln(1 + x^2)$ on $1 \le x \le 2$.

P 38. Two points on the curve $y = \dfrac{x^3}{1 + x^4}$ have opposite x values, x and $-x$. Find the points makin gthe slope of the line joining them greatest.