Find the abs. extrema of the function of the given interval.

① $y = 2x^3 + 3x^2 + 12x - 4 \quad [-2,2]$

② $f(x) = \ln(x^2 - 9) \quad [-2,5]$

Dec 5-9:32 AM

① $y = 2x^3 + 3x^2 + 12x - 4 \quad [-2,2]$

$y' = 6x^2 + 6x + 12$

$0 = 6(x^2 + x + 2)$

$x^2 + x + 2 = 0$

no real sol.

Dec 5-9:39 AM

② $f(x) = \ln(x^2 - 9) \quad [-2,5]$

$f(x) = \frac{2x}{x^2 - 9} \rightarrow \frac{2x}{(x+3)(x-3)}$

EVT does not apply

$x \neq \pm 3$

3 is in the interval

f(x) is not continuous in the given interval.

Dec 5-9:42 AM

$f(x) = (x^2 - 3)^{2/3} \quad [-3,2]$

$f'(x) = \frac{2}{3}(x^2 - 3)^{-\frac{1}{3}}(2x)$

$= \frac{4x}{3(x^2 - 3)^{\frac{1}{3}}}$

$4x = 0$

$x = 0$

$\left((x^2 - 3)^{\frac{1}{3}}\right)^{3/1} = 0^{3/1}$

$x^2 - 3 = 0$

$\sqrt{x^2} = \sqrt{3}$

$x = \pm\sqrt{3}$

$f(-3) = 3.302$

$f(-\sqrt{3}) = 0$

$f(0) = 2.08$

$f(\sqrt{3}) = 0$

$f(2) = 1$

abs max: 3.302

abs min: 0

Dec 5-9:45 AM

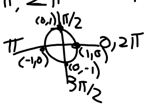
$f(x) = \sin^2 x + \cos x \quad [0, 2\pi]$

$f(x) = (\sin x)^2 + \cos x$

$f'(x) = 2\sin x \cos x - \sin x$

$0 = \sin x(2\cos x - 1)$

$\sin x = 0$	$\cos x = \frac{1}{2}$
$0, \pi, 2\pi$	$\pi/3, \frac{5\pi}{3}$



$\pi - \theta$	θ
$\theta - \pi$	$2\pi - \theta$

$\frac{2\pi}{1} - \frac{\pi}{3}$

$\frac{5\pi}{3}$

$f(0) = 1$

$f(\pi) = -1$

$f(\pi/3) = 1.25$

$f(5\pi/3) = 1.25$

$f(2\pi) = 1$

Min: -1

Max: 1.25

Dec 5-9:55 AM

$f(x) = \frac{2x}{x^2 + 4} \quad [-2,4]$

$f'(x) = \frac{(x^2+4)(2) - 2x(2x)}{(x^2+4)^2}$

$= \frac{2x^2 + 8 - 4x^2}{(x^2+4)^2} \rightarrow \frac{-2x^2 + 8}{(x^2+4)^2}$

$-2x^2 + 8 = 0$

$-2x^2 = -8$

$x^2 = 4$

$x = \pm 2$

$(x^2+4)^2 = 0$

$x^2 + 4 = 0$

$x^2 = -4$

$x = \pm 2i$

$f(-2) = -\frac{1}{2}$

$f(2) = \frac{1}{2}$

$f(4) = 2/5$

Min: $-\frac{1}{2}$

Max: $\frac{1}{2}$

Dec 5-10:06 AM