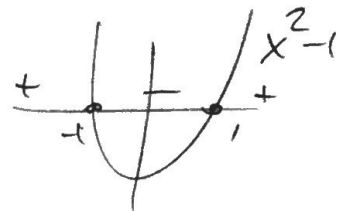


a) $f(x) = (x^2 - 1)^2 + 1$

$f'(x) = 2(x^2 - 1) \cdot 2x = 4x(x^2 - 1)$

	-1		0		1		x
	-		-		+		$x^2 - 1$
	+		-		-		$f'(x)$
	-		+		-		$f(x)$
	↘		↗		↘		



$f(x)$ is increasing on $(-1, 0) \cup (1, +\infty)$

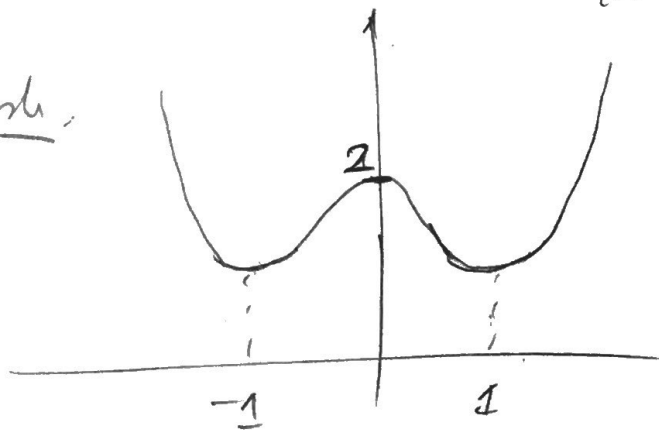
$f(x)$ is decreasing on $(-\infty, -1) \cup (0, 1)$

Critical points: $f'(x) \Leftrightarrow x = 0$ or $x = -1$ or $x = 1$.

First Derivative Test $\Rightarrow x = 0$ is a local max

$x = -1$ and $x = 1$ are local min.

Graph:



b) $f(x) = x^2 e^x$

$$f'(x) = 2xe^x + x^2 e^x = x(x+2)e^x$$

-	-2	-	0	+	x
-		+		+	x+2
+		-		+	$f'(x) = x(x+2)e^x$
↗		↘		↗	f(x)

$f(x)$ is increasing on $(-\infty, -2) \cup (0, +\infty)$

and decreasing on $(-2, 0)$

Critical points. $f'(x) = 0 \Leftrightarrow x = 0$ or $x = -2$.

First derivative test $\Rightarrow x = 0$ is a local min

$x = -2$ is a local max

Graph:

