Worksheet: Synthesize graph from calculus-type description

For each example below, create a graph which satisfies all the requirements.

Α.

f'(x) < 0 everywhere except at x = -2, 2 where f' does not exist, y = 1 is a horizontal asymptote, at x = 0 there is a point of inflection, x = -2 and x = 2 are vertical asymptotes.

В.

 $\begin{array}{ll} f(1)=1 \text{ is a relative maximum,} & f'(1) \text{ does not exist,} \\ f(4)=1 \text{ is a relative maximum,} & f'(4) \text{ does not exist,} \\ x=6 \text{ is a vertical asymptote,} \\ f''(x)>0 \text{ everywhere except at } x=1,4,6 \text{ where } f'' \text{ does not exist.} \end{array}$

C.

$$f(-2) = 3,$$
 $f'(-2) = 0,$ $f'(x) > 0$ on $(-\infty, -2) \cup (3, \infty),$
 $f(3) = -1,$ $f'(3) = 0,$ $f'(x) < 0$ on $(-2, 3),$
 $f(1) = 0$ is a point of inflection, $f'(x)$ exists everywhere.