

DATE: _____

Given the following information about $f(x)$, which is continuous on $[-3,3]$.

| x | $(-3,-2)$ | -2 | $(-2,-1)$ | -1 | $(-1,1)$ | 1 | $(1,2)$ | 2 | $(2,3)$ |
|-------|-----------|------|-----------|------|----------|-----|---------|-----|---------|
| f | + | 4 | + | 3 | + | 0 | - | -2 | - |
| f' | + | DNE | - | 0 | - | - | - | 0 | + |
| f'' | + | DNE | + | 0 | - | 0 | + | + | + |

- a) Find the x -coordinate(s) of each maximum or minimum of $f(x)$.
Justify your answer.
- b) Find the x -coordinate(s) of any inflection points of $f(x)$. Justify your answer.
- c) On what interval(s) is the graph of $f(x)$ increasing and concave up?
- d) Sketch a graph of f .

Let f be a function that is even and continuous on the closed interval $[-3,3]$. The function f and its derivatives have the properties indicated in the table below.

| | | | | | | |
|----------|-----------|-------------|---|-------------|-----------|-------------|
| x | 0 | $0 < x < 1$ | 1 | $1 < x < 2$ | 2 | $2 < x < 3$ |
| $f(x)$ | 1 | Positive | 0 | Negative | -1 | Negative |
| $f'(x)$ | Undefined | Negative | 0 | Negative | Undefined | Positive |
| $f''(x)$ | Undefined | Positive | 0 | Negative | Undefined | Negative |

a) Find the x -coordinate of each point at which f attains an absolute maximum value or an absolute minimum value. For each x -coordinate you give state whether f attains an absolute maximum or an absolute minimum.

b) Find the x -coordinate of each point of inflection on the graph of f . Justify your answer.

c) In the xy -plane below, sketch the graph of a function with all the given characteristics of f .

