

7. [12 points] For each of the descriptions of a function  $f$  that follow, indicate which of the graphs below match the description. For each description there may be no, one, or several graphs that match; write **none** if no graphs match the description. You may need to use a graph more than once. In each case you should assume that  $f$  is defined only on the domain  $[0, 2]$ .

- $f''(x) < 0$  for  $x < 1$  and  $f''(x) > 0$  for  $x > 1$ ;  $f'(x) < 0$  for  $x < 1$  and  $f'(x) > 0$  for  $x > 1$ ; and  $f(x)$  is continuous everywhere except at  $x = 1$ .

matching graph(s): \_\_\_\_\_

- $f''(x) > 0$  for all  $x \neq 1$ ;  $f(x) < 0$  for all  $x \neq 1$ ; and  $f(x)$  is differentiable everywhere except at  $x = 1$ .

matching graph(s): \_\_\_\_\_

- $f''(x) < 0$  for all  $x \neq 1$ ;  $f'(x) < 0$  for  $x < 1$  and  $f'(x) > 0$  for  $x > 1$ ; and  $f(x) < 0$  for all  $x \neq 1$ .

matching graph(s): \_\_\_\_\_

- $f''(x) < 0$  for  $x < 1$  and  $f''(x) > 0$  for  $x > 1$ ;  $f'(x) < 0$  for  $x < 1$  and  $f'(x) > 0$  for  $x > 1$ ; and  $f(x)$  is differentiable everywhere except at  $x = 1$ .

matching graph(s): \_\_\_\_\_

