MCV4U - Unit 6 Assignment - CURVE SKETCHING - QUESTION SHEET 23K 19A 17C 4T

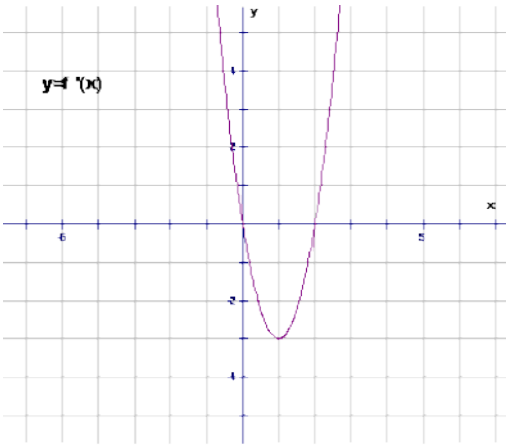
Do your answers on additional paper and just submit those pages (Hint: consider charts for some answers)

1. a) [3K 2C] Describe the graph of $f(x)$ using the terminology: increasing, decreasing, local maximum or local minimum points, intercepts, and the following information

$f'(x) < 0$ when $x < 2$; $f'(x) = 0$ when $x = 2$; $f'(x) > 0$ when $x > 2$; $f(0) = 3$, $f(1) = 0$, $f(3) = 0$.

b) Sketch the graph of $f(x)$. [2K 2A 1C]

2. The graph of the derivative function $f'(x)$ of a function $f(x)$



a) Determine: [4K 2C]

the intervals where $f(x)$ is increasing;

the intervals where $f(x)$ is decreasing;

the x -coordinate for all local extrema of $f(x)$;

the x -coordinate for the point of inflection;

the intervals of concavity.

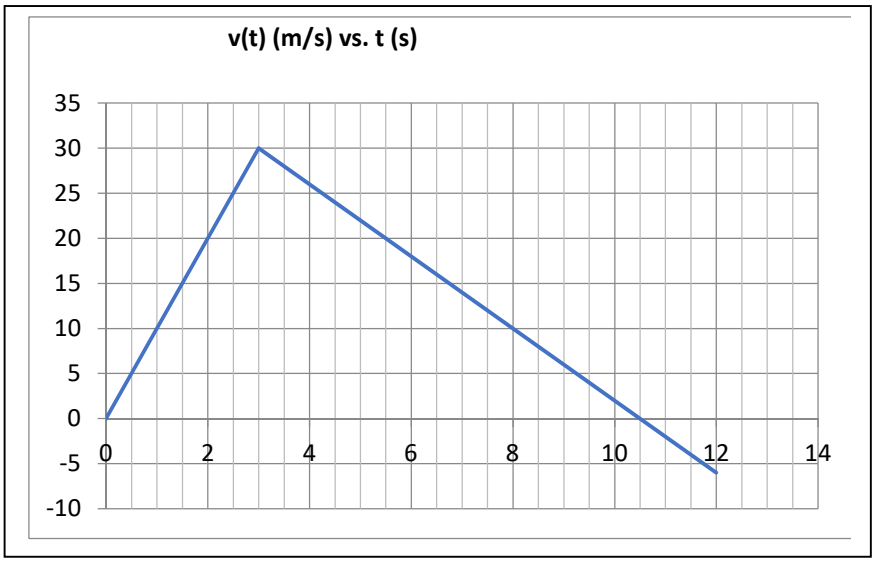
b) If $f(0) = 1$, sketch a graph of $f(x)$. [2K 2A 1C]

3. Use calculus and algebraic methods to do a complete analysis (i.e., intervals of increase and decrease, intercepts, critical points, points of inflection, and intervals of concavity) for each of the following functions and then use technology to draw the graph of the function and verify your analysis. [6K 3A 3C EACH]

a) $f(x) = x^3 - 3x^2$ b) $g(x) = (x - 2)^3(x - 6)$

4. A bungee jumper jumps from a bridge that is 100 m above water level. A velocity-time graph is shown. The elasticity in the bungee cord begins to slow the jumper down after 3s. The displacement of the jumper is measured from the point of the jump Determine the displacement function – explaining all steps and points - and plot the graph from $0<t<12$s

[5A 2T 3C]



5. The function $h(x) = x^3 + bx^2 + d$ has a critical point at (2, -4). Determine the constants b and d and find the equation of h(x). Show your work [4A 2T 2C]