Lab – Using derivatives for graphs

1. For the following diagrams with signs for *f’* and *f’’*, draw a possible graph for *f*



1. For the functions A-F below,
2. Find the formula of f’ and f’’.
3. Find the values of x where f’ and f’’ are equal to zero.
4. Create a numberline with the signs of f’ and f’’ as done in problem 1
5. Find the coordinates of the points of inflection, local maxima and minima
6. Draw the graph of *f* labeling max/min/pts of inflection. (feel free to check with Desmos)
7. $f\left(x\right)=\frac{x^{3}}{3}-\frac{x^{2}}{2}-12x$
8. $f\left(x\right)=\frac{1}{x}$
9. $f\left(x\right)=x^{3}+3x^{2}-24x$
10. $f\left(x\right)=sin(x)-cos(x)$ on the interval [0,2pi]
11. $f\left(x\right)=\frac{x^{4}}{4}-2x^{2}$
12. $f\left(x\right)=\frac{x}{e^{2x}}$ (Hint: easier to rewrite as a product)
13. Optional: $f\left(x\right)=cot(x)$on the interval [0,2pi]