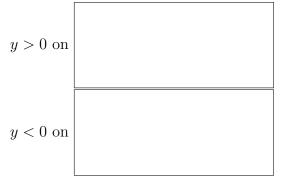Name: _____ GTID: _____

Answer the questions in the spaces provided and put your answer in the $\boxed{\text{BOX}}$. Organize and show your work for full credit.

1. For this page use the function $f(x) = (x+2)^3(x-1)^2(x-3)$.

1a. State the roots of $y = f(x)$ and the multiplicity of each root. Also, for each root classify the intercept as crosses or touches.

Note: circle your answer.

$x =$ [ ]   with multiplicity [ ]   CROSSES/TOUCHES

$x =$ [ ]   with multiplicity [ ]   CROSSES/TOUCHES

$x =$ [ ]   with multiplicity [ ]   CROSSES/TOUCHES

1b. Make a sign chart for $y = f(x)$ and determine the x-values where $y > 0$ or $y < 0$.
Note: Give your answer in interval notation or by using inequalities.

$y > 0$ on [ ]

$y < 0$ on [ ]

2. Evaluate: $y = \log_{\frac{1}{2}}(8)$

3. Sketch: $y = 4^{-x}$. Label any intercepts, label the axes and the curve, and identify and include a total of at least four points on your graph for full credit.

4. An account earns simple interest at a rate of 10% per year. If $2,000 is deposited, how much money is in the account after 8 years?
   Note: you must clearly set up the problem, but you do not need evaluate the expression.