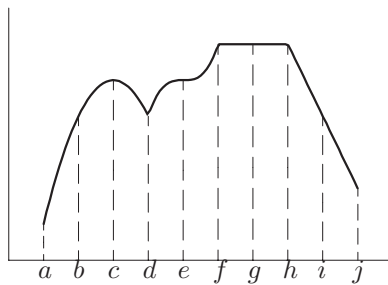


Directions: Show **ALL** work for credit; Give **EXACT** answers when possible; Start each problem on a **SEPARATE** page; Use only **ONE** side of each page; Be neat; Leave margins on the left and top for the **STAPLE**; Calculators can be used for graphing and calculating only; Nothing written on this page will be graded;

1. Use a linear approximation or the differential to approximate $\sqrt{24.982}$. Use the second derivative to say if your approximation is too small or too large.
2. Consider the graph below. Fill in a table like one below with X's in the locations where the answer is yes. (Leave blank the squares where the answer is no.)



	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>	<i>i</i>	<i>j</i>
Absolute Minimum										
Absolute Maximum										
Local Minimum										
Local Maximum										
$f'(x)$ does not exist										
$f'(x) = 0$										

3. Find the equation of the tangent line to $y = \sinh(x + \ln 5)$ at $x = 0$. Show all the steps and simplify your answer (no fractions, no decimals, no ln's).
4. Find the derivative $D^{1000}xe^{-x}$ by finding the first few derivatives (at least 3) and observing the pattern that occurs.
5. Dr. Hare, a one meter tall Texas rabbit, is racing towards the bottom of a vertical cliff at three meters per second. Behind and chasing the rabbit is a tiny model race car, shined with turtle wax, with its headlights on. The headlights are essentially on the flat ground. It is dark and the height of the rabbits shadow on the cliff is decreasing at $1/5$ of a meter per second when the rabbit is 10 meters from the cliff, and the model car is another 10 meters behind the rabbit. How fast is the turtle-waxed model car going at this moment?

