

This sheet can be used for scratch-work—if so, write name and attach to submission

### Some Formulas

$$L_i(x) = \frac{(x-x_0)\cdots(x-x_{i-1})(x-x_{i+1})\cdots(x-x_n)}{(x_i-x_0)\cdots(x_i-x_{i-1})(x_i-x_{i+1})\cdots(x_i-x_n)} = \prod_{\substack{j=0 \\ j \neq i}}^n \frac{x-x_j}{x_i-x_j} \quad y = \sum_{i=0}^n y_i L_i(x)$$

$$P[x_i](x) = y_i \quad P[x_i, \dots, x_{i+k}](x) = \frac{(x-x_{i+k})P[x_i, \dots, x_{i+k-1}](x) + (x_i-x)P[x_{i+1}, \dots, x_{i+k}](x)}{x_i-x_{i+k}}$$

$$s_i(x) = \frac{y_i''}{6}(x-x_{i-1}) \frac{(x-x_{i-1})^2 - (x_i-x_{i-1})^2}{x_i-x_{i-1}} + \frac{y_{i-1}''}{6}(x_i-x) \frac{(x_i-x)^2 - (x_i-x_{i-1})^2}{x_i-x_{i-1}} + \frac{y_{i-1}(x_i-x) + y_i(x-x_{i-1})}{x_i-x_{i-1}}$$

$$y_{i-1}''(x_{i-1}-x_i) + 2y_i''(x_{i-1}-x_{i+1}) + y_{i+1}''(x_i-x_{i+1}) = 6 \left( \frac{y_{i-1}-y_i}{x_{i-1}-x_i} - \frac{y_i-y_{i+1}}{x_i-x_{i+1}} \right) S = \sum_{i=0}^n W_i^2 [y_i - f(x_i)]^2$$

$$[y_i] = y_i \quad [y_i, \dots, y_{i+k}] = \frac{[y_{i+1}, \dots, y_{i+k}] - [y_i, \dots, y_{i+k-1}]}{x_{i+k} - x_i} \quad f(x) = \sum_{n=0}^{\infty} \frac{f^{(n)}(a)}{n!} (x-a)^n$$

$$f'(x) = \frac{f(x+h) - f(x)}{h} + \mathcal{O}(h) = \frac{f(x) - f(x-h)}{h} + \mathcal{O}(h) = \frac{f(x+h) - f(x-h)}{2h} + \mathcal{O}(h^2)$$

$$f''(x) = \frac{f(x+h) - 2f(x) + f(x-h)}{h^2} + \mathcal{O}(h^2) \quad a = \frac{\sum x_i(y_i - \bar{y})}{\sum x_i(x_i - \bar{x})} \quad b = \bar{y} - a\bar{x} \quad G = \frac{2^p g(h/2) - g(h)}{2^p - 1}$$

### Reminders

On your workdesk:

- Writing implements: pens, correction devices
- Calculator (optional)
- A water bottle (optional)
- Phones, tablets or other internet enabled devices:  
**turned off** (not silent mode), **face down**

No communication with other test-takers allowed:  
raise hand for attention and blank sheets

Bags can be placed underneath  
or at the sides of the room

No toilet breaks during quiz-taking

Submit sheets to front