Part 1B: $y'' - (x-2)y' + 2y = 0$

$$f(x) = f(x_0) + \frac{f'(x_0)}{1!}(x-x_0) + \frac{f''(x_0)}{2!}(x-x_0)^2 + \dots$$

$x_0 = 3$

$f(3) = 6$

$f'(3) = 1$

$$f(x) = f(3) + f'(3)(x-3) + \frac{1}{2}f''(3)(x-3)^2$$

$f'' - (x-2)f' + 2f = 0$

$f'' = (x-2)f' - 2f$

$f''(3) = (3-2)f'(3) - 2f(3)$

$f''(3) = 1 - 12 = -11$

$$f(x) = 6 + 1\cdot(x-3) + \frac{1}{2}\cdot(-11)\cdot(x-3)^2$$

$$\boxed{f(x) = 6 + (x-3) - \tfrac{11}{2}(x-3)^2}$$