

# Assignment 3

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# Contents

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The value functions are as follows:

$$v_1(x_1) = \frac{1}{40}x_1 \quad (1)$$

$$v_2(x_2) = \begin{cases} 0, & 0 \leq x_2 \leq 2 \\ \frac{1}{12}x_2 - \frac{1}{6}, & 2 \leq x_2 < 6 \\ \frac{1}{27}x_2 + \frac{1}{9}, & 6 \leq x_2 < 15 \\ \frac{1}{45}x_2 + \frac{1}{3}, & 15 \leq x_2 \leq 30 \end{cases} \quad (2)$$

$$v_3(x_3) = \begin{cases} \frac{1}{14}x_3 - \frac{1}{7} & 2 \leq x < 9 \\ \frac{1}{42}x_3 + \frac{2}{7} & 9 \leq x \leq 30 \end{cases} \quad (3)$$

$$v_4(x_4) = \frac{1}{18}x_4 - \frac{1}{9} \quad (4)$$

$$v_5(x_5) = \frac{1}{20}x_5 \quad (5)$$

$$v_6(x_6) = \frac{1}{20}x_6 \quad (6)$$

$$v_7(x_7) = \frac{1}{100}x_7 \quad (7)$$

$$v_8(x_8) = \frac{512}{1023}0.5^{x_8} + \quad (8)$$

$$v_9(x_9) = \quad (9)$$

$$y - y_1 = m(x - x_1) \quad (10)$$

$$y_2 = mx_2 - mx_1 + y_1 \quad (11)$$

$$y_2 = mx_2 - mx_1 + (m(x_1 - x_0) + y_0) \quad (12)$$

$$B + A(1 - e^{-(3-x_9)/r})$$