Question 11.16.3.8
Probability and Random Processes

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A team of medical students doing their internship have to assist during surgeries at a city hospital. The probabilities of surgeries rated as very complex, complex, routine, simple or very simple are respectively, 0.15, 0.20, 0.31, 0.26, .08. Find the probabilities that a particular surgery will be rated

1) complex or very complex;
2) neither very complex nor very simple;
3) routine or complex
4) routine or simple

Solution:

$$
X = \begin{cases} 1, & \text{very complex} \\ 2, & \text{complex} \\ 3, & \text{routine} \\ 4, & \text{simple} \\ 5, & \text{very simple} \end{cases} \tag{1}
$$

1) complex or very complex

$$
= p_X(1) + p_X(2) \tag{2}
$$
$$
= 0.15 + 0.20 \tag{3}
$$
$$
= 0.35 \tag{4}
$$

2) neither very complex nor very simple

$$
= 1 - (p_X(1) + p_X(5)) \tag{5}
$$
$$
= 1 - (0.15 + 0.08) \tag{6}
$$
$$
= 0.77 \tag{7}
$$

3) routine or complex

$$
= p_X(2) + p_X(3) \tag{8}
$$
$$
= 0.20 + 0.31 \tag{9}
$$
$$
= 0.51 \tag{10}
$$

4) routine or simple

$$
= p_X(3) + p_X(4) \tag{11}
$$
$$
= 0.31 + 0.26 \tag{12}
$$
$$
= 0.57 \tag{13}
$$