

(18) KEBARANGKALIAN - PROBABILITY I / II

(a) Kebarangkalian suatu peristiwa (Probability of an event)  $P(A)$

$P(A) = \frac{n(A)}{n(S)}, 0 \leq P(A) \leq 1$		
<p><b>Contoh 1 :</b></p> <div style="text-align: center;"> </div> <p style="text-align: center; margin-top: 20px;"><math>\Rightarrow P(B) = \frac{3}{10}</math></p> <p style="text-align: center;"><math>\Rightarrow P(R) = \frac{7}{10}</math></p>	<p><b>Contoh 2 :</b></p> <div style="text-align: center;"> </div> <p style="text-align: center; margin-top: 20px;"><math>\frac{x}{20} = \frac{1}{5}</math></p> <p style="text-align: center;"><math>5x = 20</math></p> <p style="text-align: center;"><math>x = \frac{20}{5}</math></p> <p style="text-align: center;"><math>x = 4</math></p>	<p><b>Contoh 3 :</b></p> <div style="text-align: center;"> </div> <p style="text-align: center; margin-top: 20px;"><math>\frac{x}{x+12} = \frac{2}{3}</math></p> <p style="text-align: center;"><math>3x = 2x + 24</math></p> <p style="text-align: center;"><math>3x - 2x = 24</math></p> <p style="text-align: center;"><math>x = 24</math></p>

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(b) Kebarangkalian pelengkap suatu peristiwa (Probability of the complement of an event),  $P(A')$

$P(A') = 1 - P(A)$	$P(A) + P(A') = 1$	
<p><b>Example 1 :</b></p> <div style="text-align: center;"> </div> <p style="text-align: center; margin-top: 20px;"><math>P(G) = 1 - \frac{2}{7}</math></p> <p style="text-align: center;"><math>= \frac{5}{7}</math></p>	<p><b>Example 2 :</b></p> <div style="text-align: center;"> </div> <p style="text-align: center; margin-top: 20px;"><math>P(D) = 1 - \frac{1}{3} - \frac{2}{9}</math></p> <p style="text-align: center;"><math>= \frac{4}{9}</math></p>	<p><b>Example 3 :</b></p> <div style="text-align: center;"> </div> <p style="text-align: center; margin-top: 20px;"><math>\frac{4}{x} = \frac{1}{6}</math></p> <p style="text-align: center;"><math>x = 24</math></p>

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(c) Kebarangkalian peristiwa gabungan - Probability of combined event

$P(A \text{ and } B) = P(A \cap B) = \frac{n(A \cap B)}{n(\Omega)} = P(A) \times P(B)$	$P(A \text{ or } B) = P(A \cup B) = \frac{n(A \cup B)}{n(\Omega)} = P(A) + P(B)$	
<p><b>Example 1 :</b></p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center; margin-right: 20px;"> </div> <div> <p>M (merah) 2 guli dipilih secara rawak dan dimasukkan semula 2 marbles are chosen at random, <i>with replacement</i></p> <p>B (biru)</p> </div> </div>		
<p>(i) <math>P(MM)</math></p> $= \frac{5}{9} \times \frac{5}{9}$ $= \frac{25}{81}$	<p>(ii) <math>P(MB)</math></p> $= \frac{5}{9} \times \frac{4}{9}$ $= \frac{20}{81}$	<p>(iii) <math>P(\text{hanya } M)</math></p> $= P(MB \text{ or } BM)$ $= \frac{5}{9} \times \frac{4}{9} + \frac{4}{9} \times \frac{5}{9}$ $= \frac{40}{81}$
<p><b>Example 2 :</b></p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center; margin-right: 20px;"> </div> <div> <p>P(Perempuan) <math>\Rightarrow</math> 2 workers are selected at random, 2 pekerja dipilih secara rawak</p> <p>L(Lelaki)</p> </div> </div>		
<p>(i) <math>P(\text{pertama } P \text{ dan kedua } L)</math></p> $= P(PL)$ $= \frac{7}{12} \times \frac{5}{11}$ $= \frac{35}{132}$	<p>(ii) <math>P(\text{Kedua-dua } P)</math></p> $= P(PP)$ $= \frac{5}{12} \times \frac{4}{11}$ $= \frac{5}{33}$	<p>(iii) <math>P(\text{kedua-dua sama jantina})</math></p> $= P(PP \text{ or } LL)$ $= \frac{7}{12} \times \frac{6}{11} + \frac{5}{12} \times \frac{4}{11}$ $= \frac{31}{66}$
<p>(iv) <math>P(\text{seorang } P \text{ seorang } L)</math></p> $= P(LP \text{ or } PL)$ $= \frac{7}{12} \times \frac{5}{11} + \frac{5}{12} \times \frac{7}{11}$ $= \frac{35}{66}$	<p>(v) <math>P(\text{sekurang-kurang seorg } P)</math></p> $= P(LP \text{ or } LP \text{ or } PP)$ $= \frac{7}{12} \times \frac{5}{11} + \frac{5}{12} \times \frac{7}{11} + \frac{7}{12} \times \frac{6}{11}$ $= \frac{28}{33}$	$= 1 - P(MM)$ <p><b>or</b></p> $= 1 - \frac{5}{12} \times \frac{4}{11}$ $= \frac{28}{33}$