Auto-évaluation ex 5 page 115

Sésamath

Maths TS spécialité

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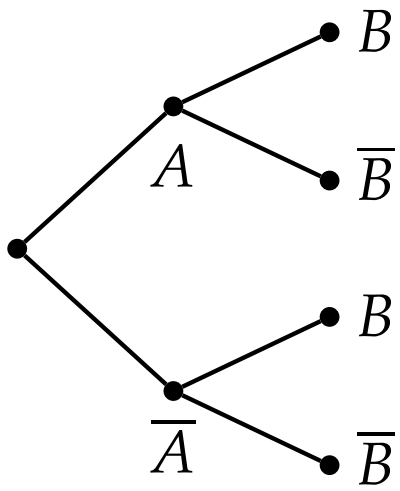
énoncé

Soit A et B deux événements d'un univers tels que

$$P(A) = \frac{3}{5}, P_A(B) = \frac{1}{2} \text{ et } P_{\overline{A}}(\overline{B}) = \frac{4}{5}.$$

1. Calculer $P(B)$ puis $P_B(A)$.
2. Pondérer les arbres de probabilité suivants.

a)



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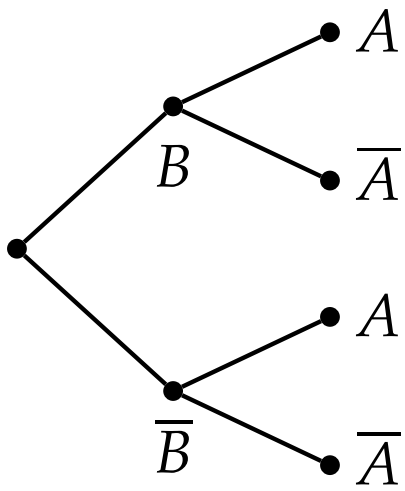

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correction

1. On a $P(A) = \dfrac{3}{5}$ et $P_A(B) = \dfrac{1}{2}$

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correction

1. On a $P(A) = \dfrac{3}{5}$ et $P_A(B) = \dfrac{1}{2}$

   Or,

$$P_A(B) = \frac{P(A \cap B)}{P(A)}$$

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correction

1. On a $P(A) = \dfrac{3}{5}$ et $P_A(B) = \dfrac{1}{2}$

   Or,

   $$P_A(B) = \frac{P(A \cap B)}{P(A)}$$

   Ainsi,

   $$P(A \cap B) = P_A(B)P(A)$$

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correction

1 On a $P(A) = \dfrac{3}{5}$ et $P_A(B) = \dfrac{1}{2}$

Or,

$$P_A(B) = \frac{P(A \cap B)}{P(A)}$$

Ainsi,

$$P(A \cap B) = P_A(B)P(A)$$

soit,

$$P(A \cap B) = \frac{1}{2} \times \frac{3}{5} = \frac{3}{10}$$

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correction

1. On a $P(A) = \dfrac{3}{5}$ et $P_{\overline{A}}(\overline{B}) = \dfrac{4}{5}$

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correction

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   Or,

$$P_{\overline{A}}(\overline{B}) = \frac{P(\overline{A} \cap \overline{B})}{P(\overline{A})}$$

BY-SA

correction

1. On a $P(A) = \dfrac{3}{5}$ et $P_{\overline{A}}(\overline{B}) = \dfrac{4}{5}$

   Or,

   $$P_{\overline{A}}(\overline{B}) = \frac{P(\overline{A} \cap \overline{B})}{P(\overline{A})}$$

   Ainsi,

   $$P(\overline{A} \cap \overline{B}) = P_{\overline{A}}(\overline{B})P(\overline{A})$$

BY-SA

correction

1. On a $P(A) = \dfrac{3}{5}$ et $P_{\overline{A}}(\overline{B}) = \dfrac{4}{5}$

   Or,

   $$P_{\overline{A}}(\overline{B}) = \frac{P(\overline{A} \cap \overline{B})}{P(\overline{A})}$$

   Ainsi,

   $$P(\overline{A} \cap \overline{B}) = P_{\overline{A}}(\overline{B})P(\overline{A})$$

   soit,

   $$P(\overline{A} \cap \overline{B}) = P_{\overline{A}}(\overline{B})(1 - P(A))$$

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correction

1 On a $P(A) = \dfrac{3}{5}$ et $P_{\overline{A}}(\overline{B}) = \dfrac{4}{5}$

Or,

$$P_{\overline{A}}(\overline{B}) = \frac{P(\overline{A} \cap \overline{B})}{P(\overline{A})}$$

Ainsi,

$$P(\overline{A} \cap \overline{B}) = P_{\overline{A}}(\overline{B})P(\overline{A})$$

soit,

$$P(\overline{A} \cap \overline{B}) = P_{\overline{A}}(\overline{B})(1 - P(A))$$

Par conséquent,

$$P(\overline{A} \cap \overline{B}) = \frac{4}{5}\left(1 - \frac{3}{5}\right) = \frac{8}{25}$$

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correction

1. Or

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correction

1. Or

$$P(A \cup B) = 1 - P\left(\overline{A} \cap \overline{B}\right)$$

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correction

1 Or

$$P(A \cup B) = 1 - P\left(\overline{A} \cap \overline{B}\right)$$

Ainsi,

$$P(A \cup B) = 1 - \frac{8}{25} = \frac{17}{25}$$

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correction

1 De plus,

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

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correction

1 De plus,

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

donc,

$$P(B) = P(A \cup B) - P(A) + P(A \cap B)$$

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correction

1

De plus,

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

donc,

$$P(B) = P(A \cup B) - P(A) + P(A \cap B)$$

par conséquent,

$$P(B) = \frac{17}{25} - \frac{3}{5} + \frac{3}{10}$$

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correction

1 De plus,

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

donc,

$$P(B) = P(A \cup B) - P(A) + P(A \cap B)$$

par conséquent,

$$P(B) = \frac{17}{25} - \frac{3}{5} + \frac{3}{10}$$

soit,

$$P(B) = \frac{19}{50}$$

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correction

1 On a,

$$P_B(A) = \frac{P(A \cap B)}{P(B)}$$

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correction

1 On a,

$$P_B(A) = \frac{P(A \cap B)}{P(B)}$$

donc,

$$P_B(A) = \frac{\frac{3}{10}}{\frac{19}{50}}$$

BY-SA

correction

1 On a,

$$P_B(A) = \frac{P(A \cap B)}{P(B)}$$

donc,

$$P_B(A) = \frac{\frac{3}{10}}{\frac{19}{50}}$$

Ainsi,

$$P_B(A) = \frac{15}{19}$$

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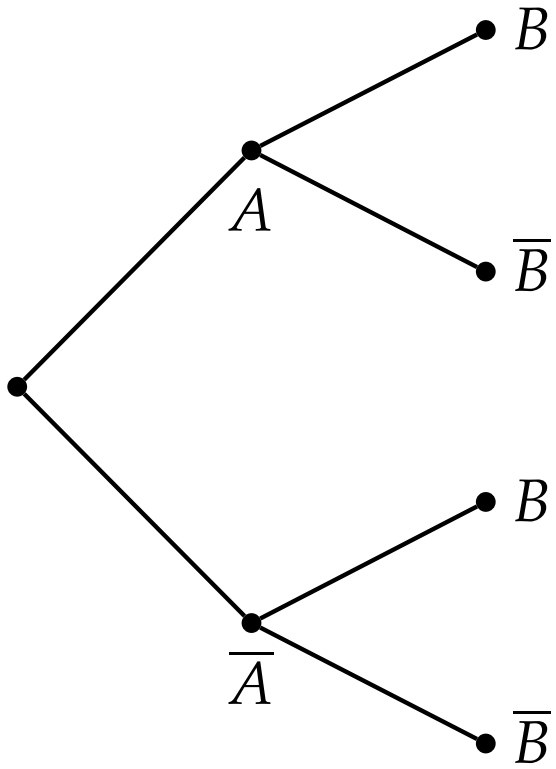
correction

2

a)



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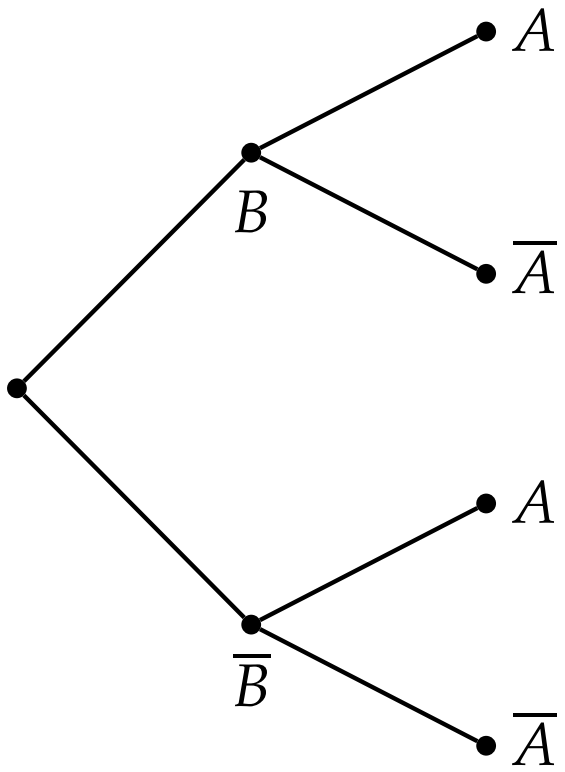

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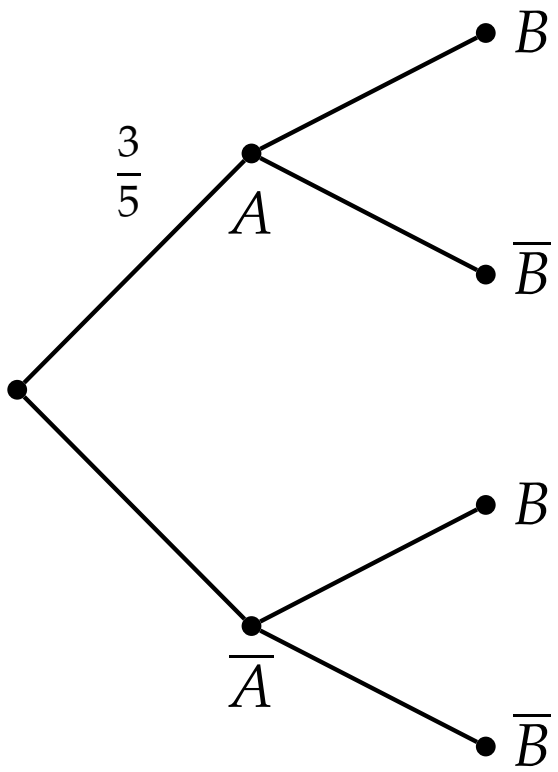
correction

2

a)



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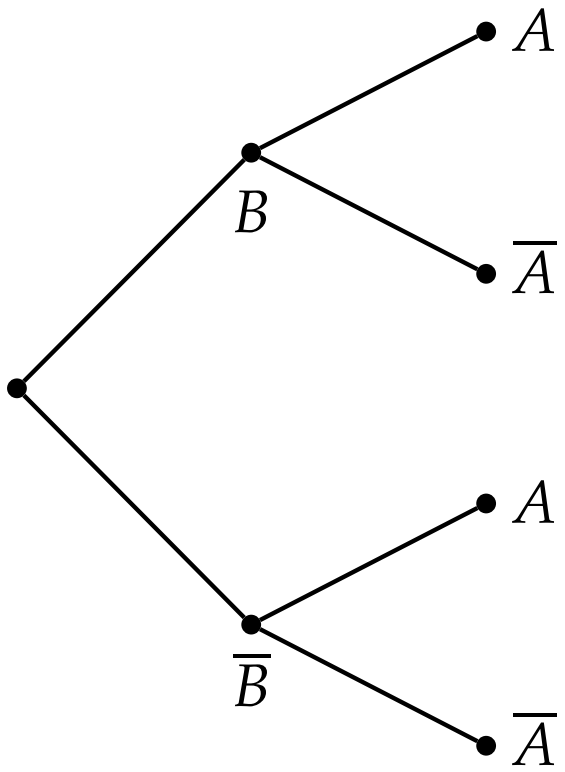
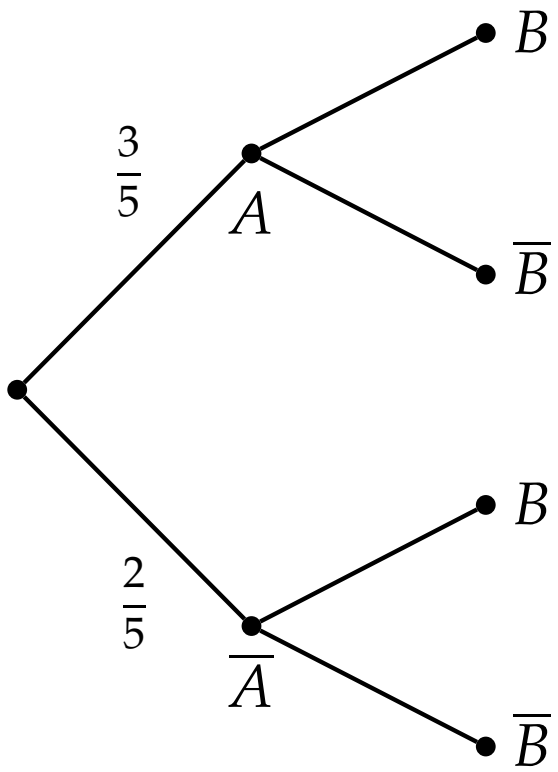


BY-SA

correction

2

a)



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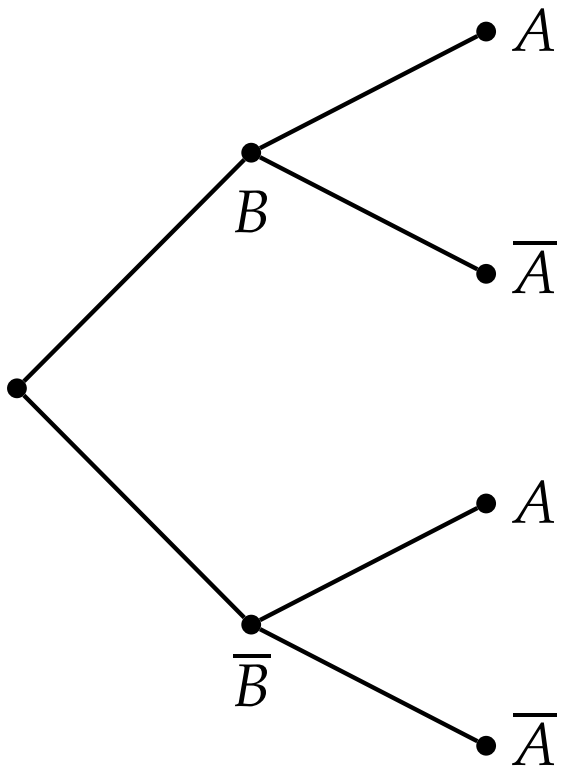

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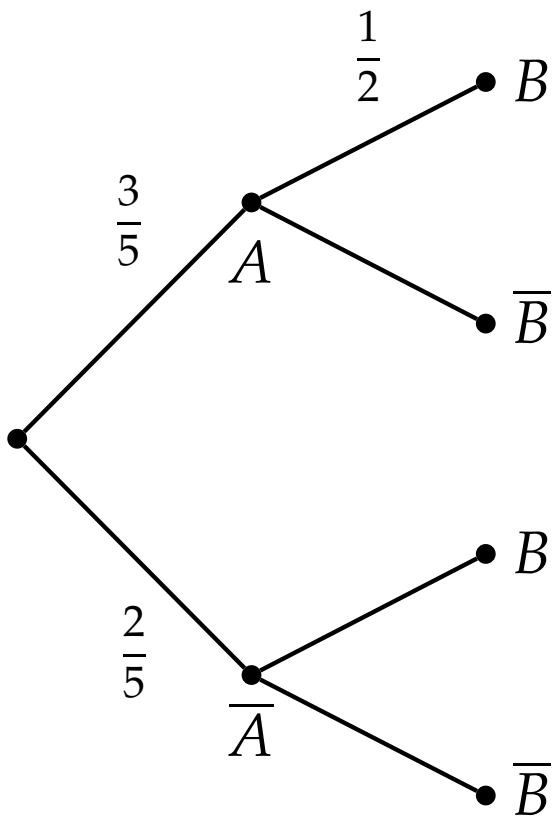
correction

2

a)



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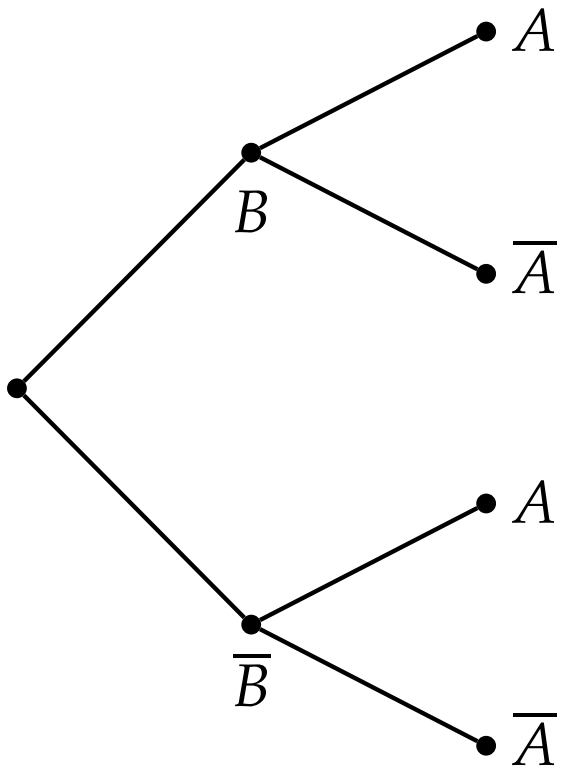
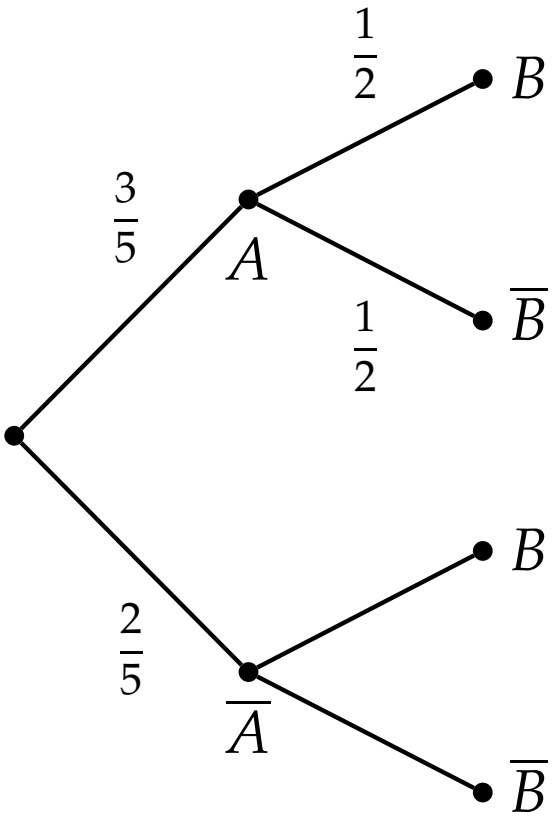


BY-SA

correction

2

a)



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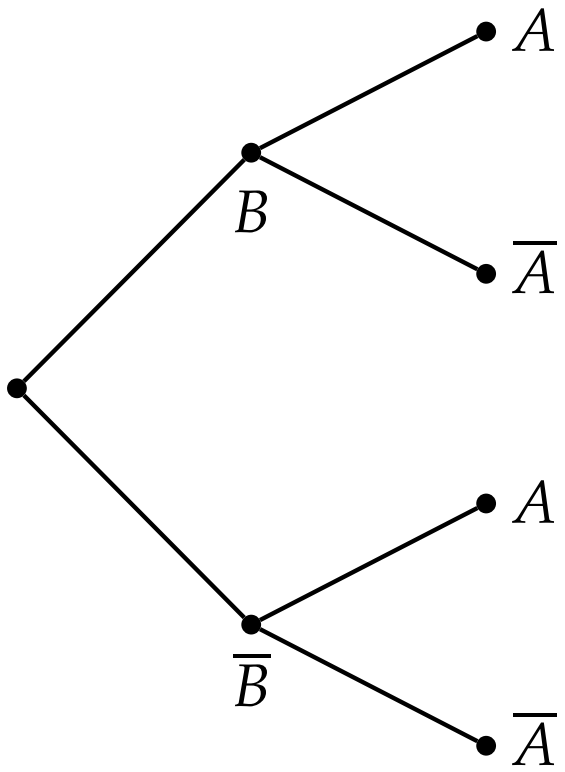

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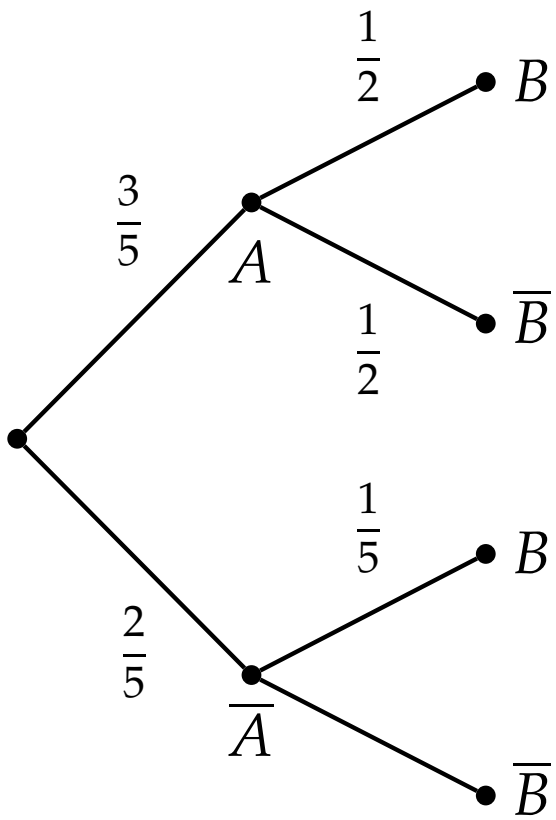
correction

2

a)



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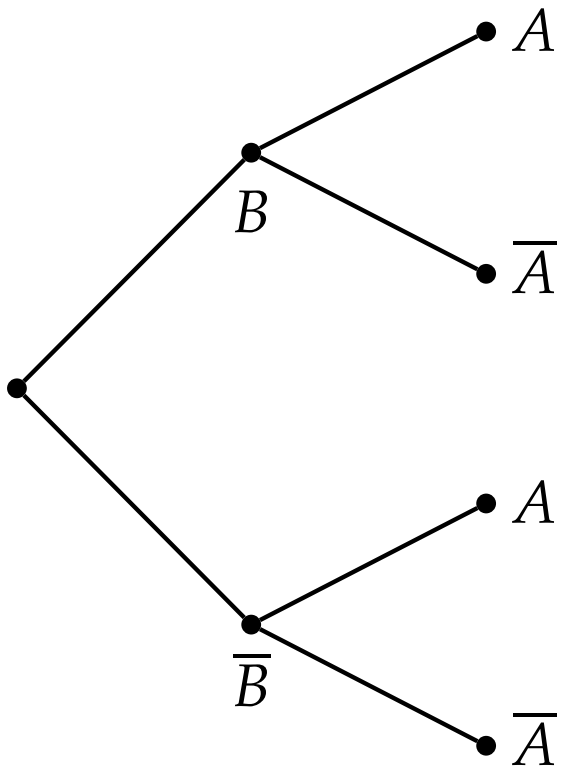
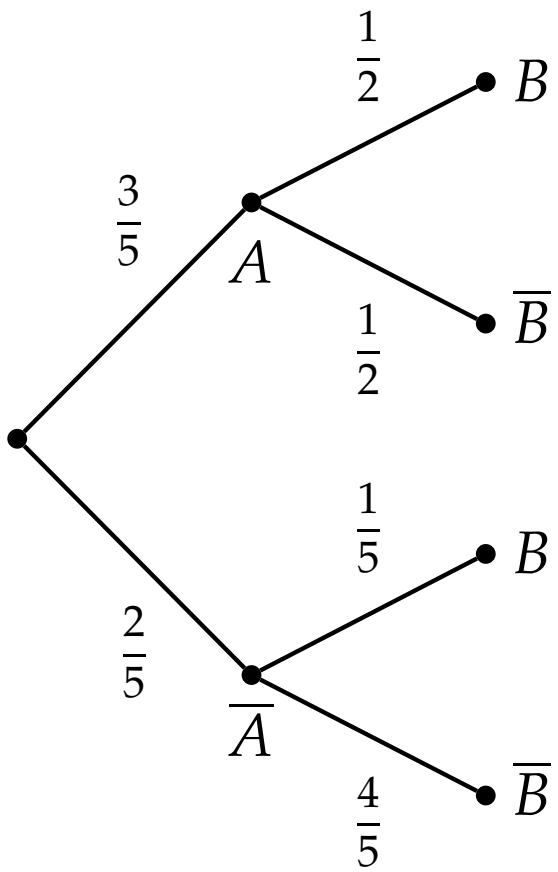


BY-SA

correction

2

a)



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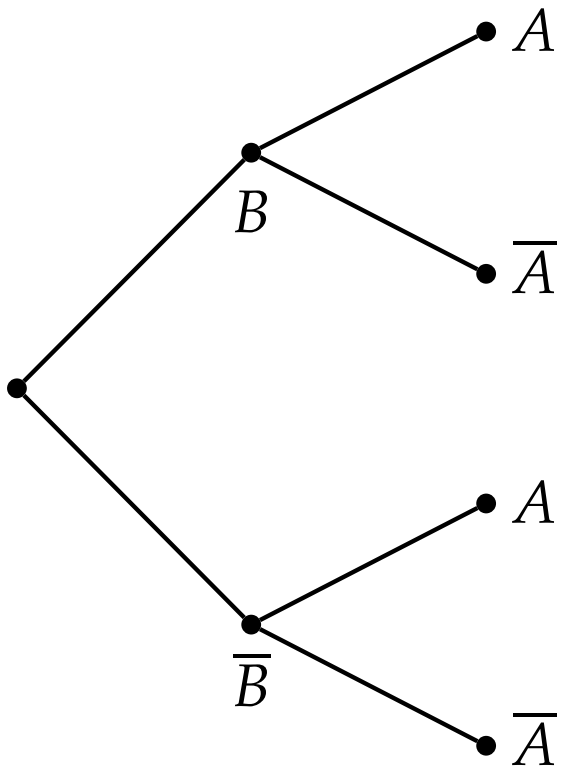

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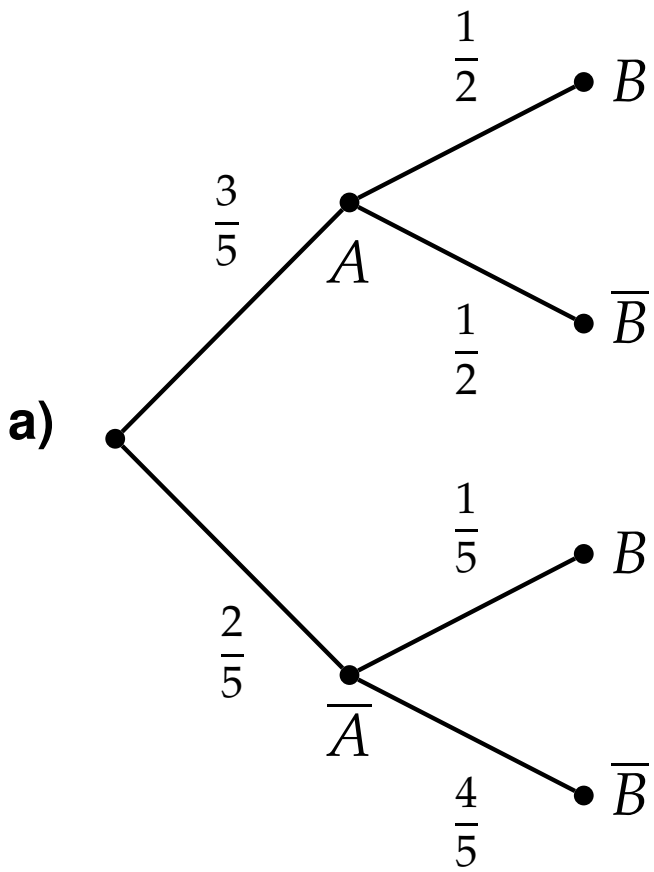
correction

2

a)



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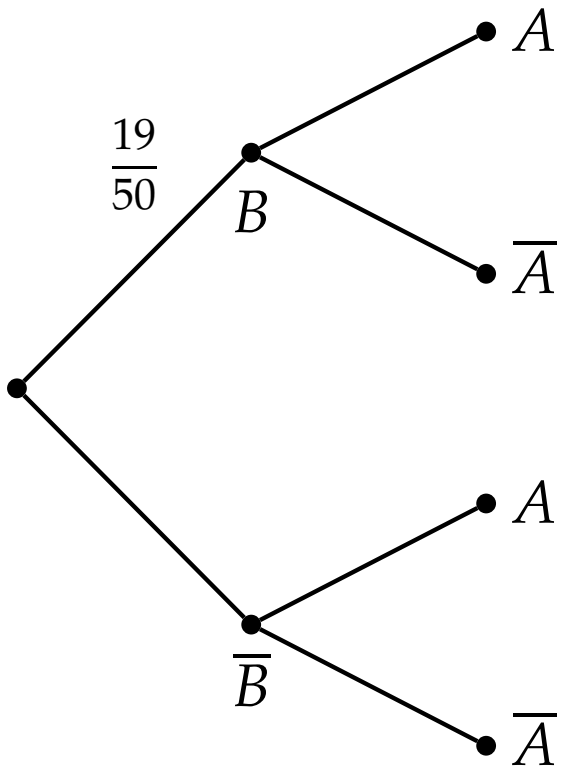

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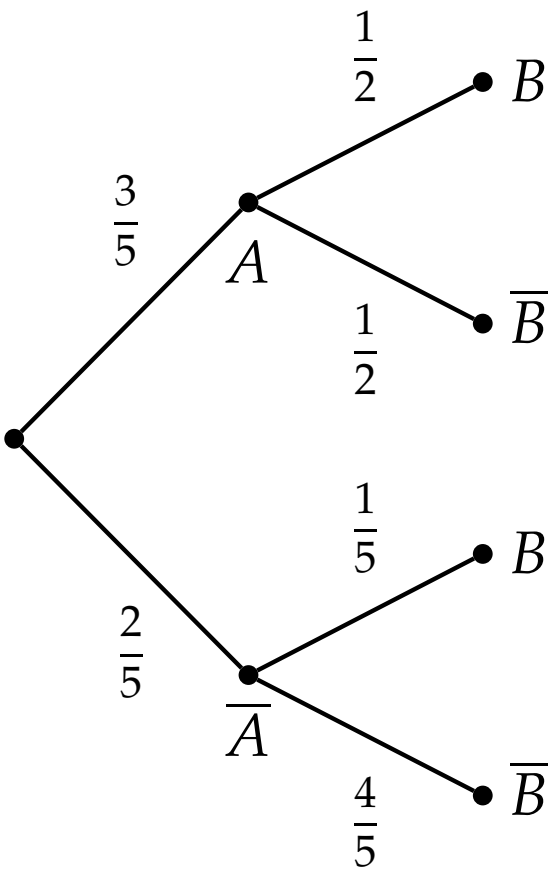
correction

2

a)



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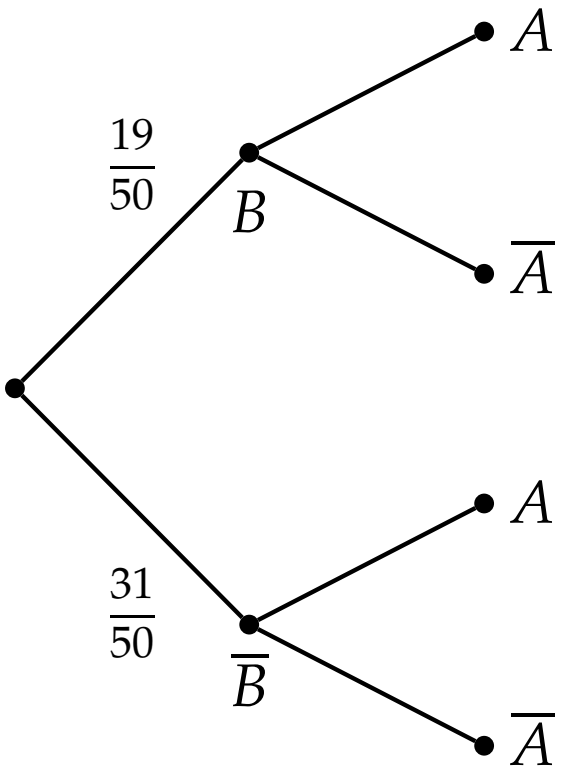
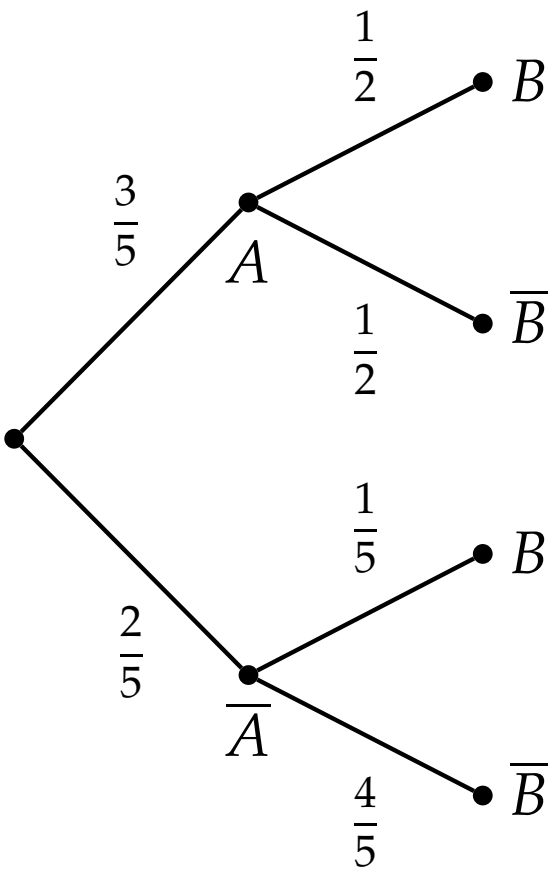


BY-SA

correction

2

a)



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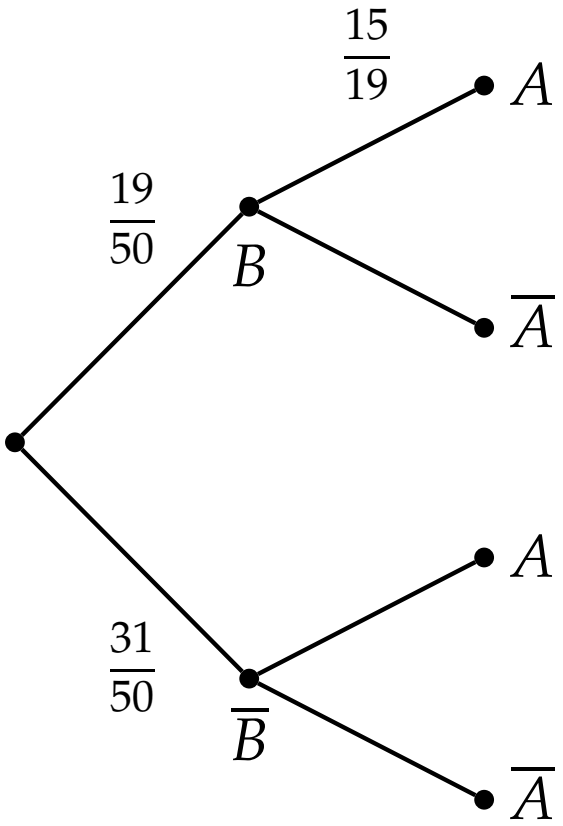
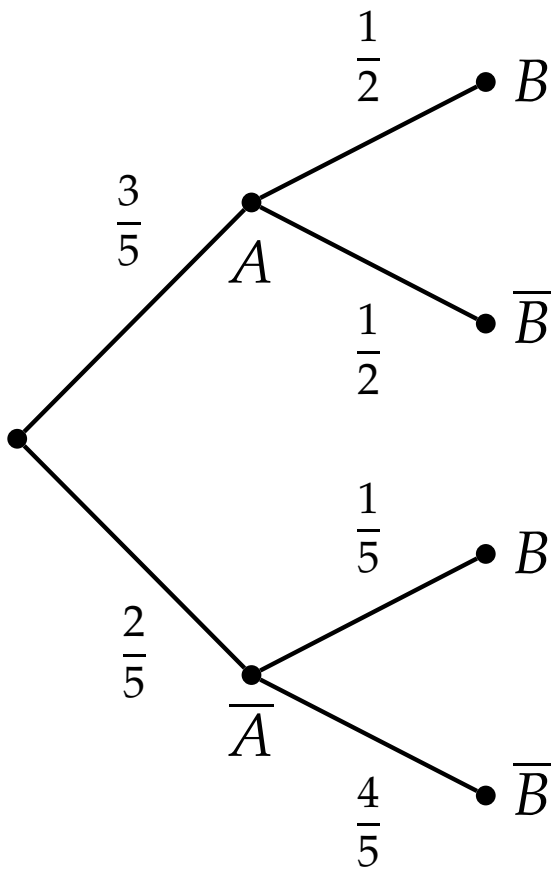


BY-SA

correction

2

a)



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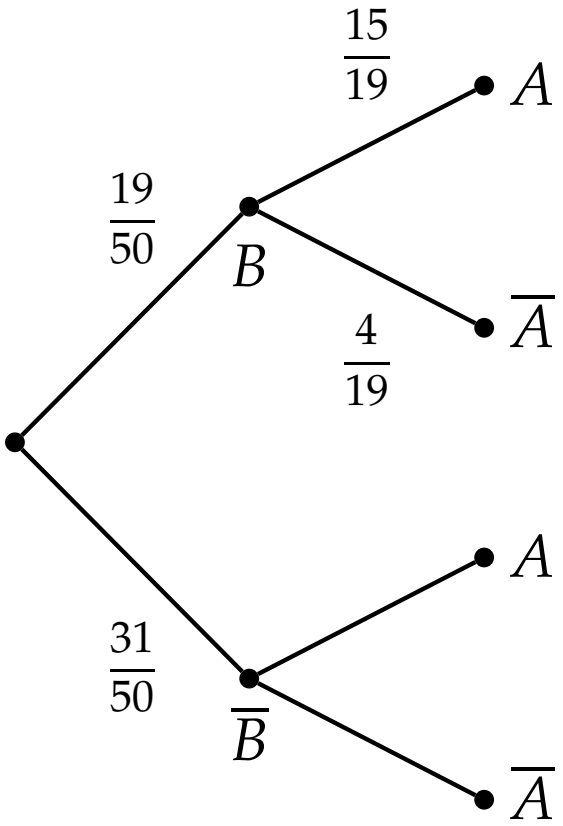

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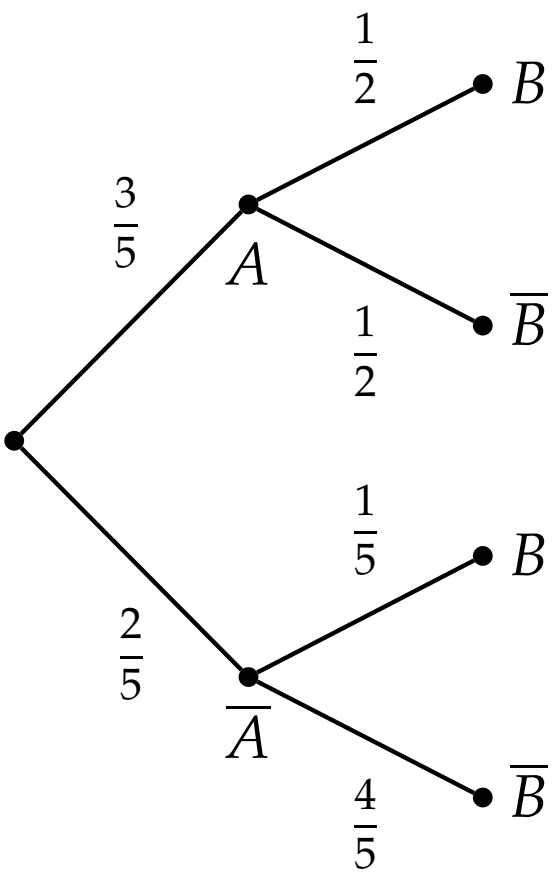
correction

2

a)



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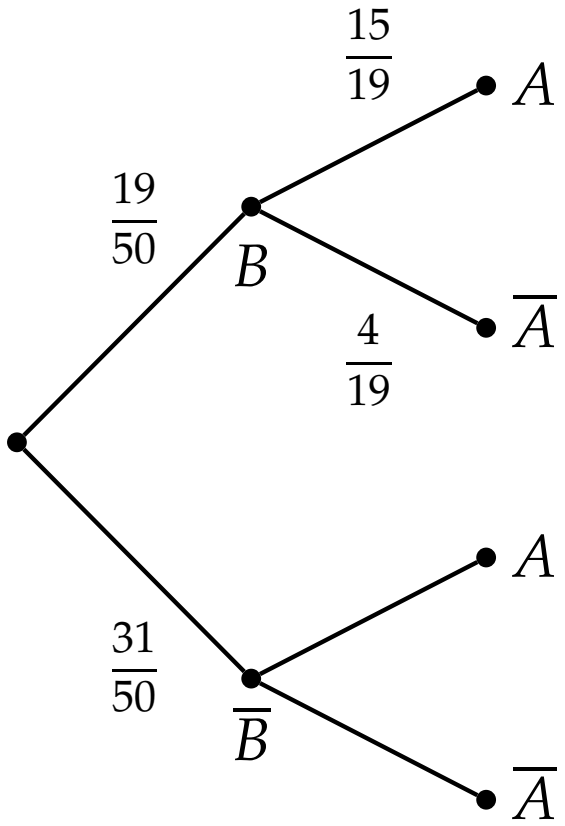


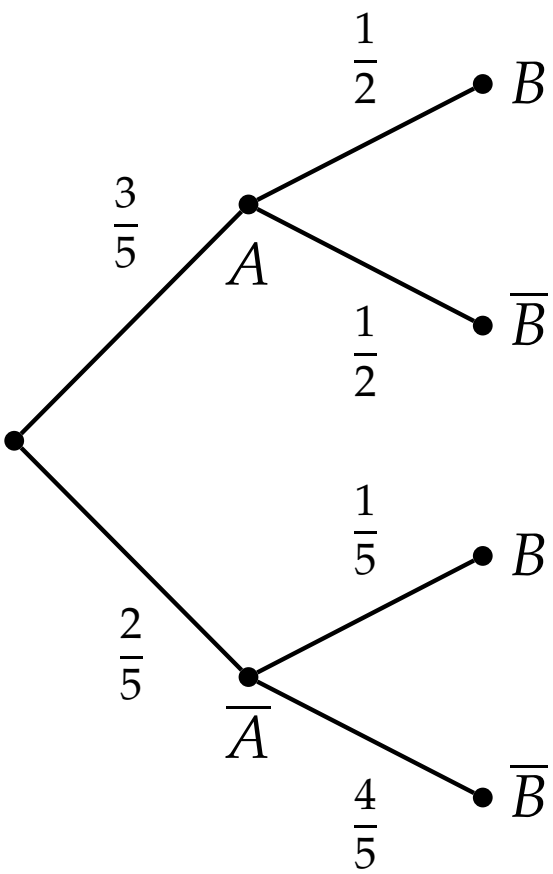
$$P_{\overline{B}}(\overline{A}) = \frac{P(\overline{A} \cap \overline{B})}{\overline{B}} = \frac{\frac{8}{25}}{\frac{31}{50}} = \frac{16}{31}$$

BY-SA

correction

2

a)



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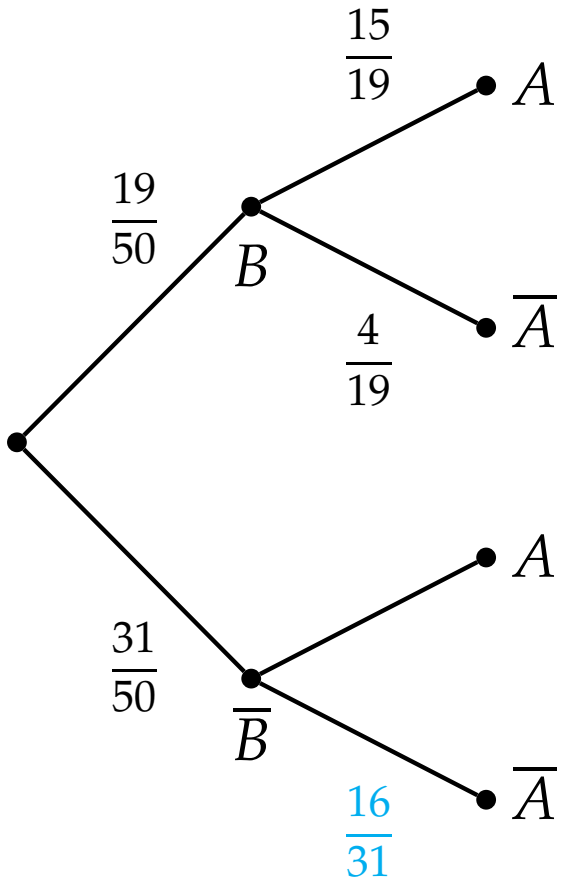


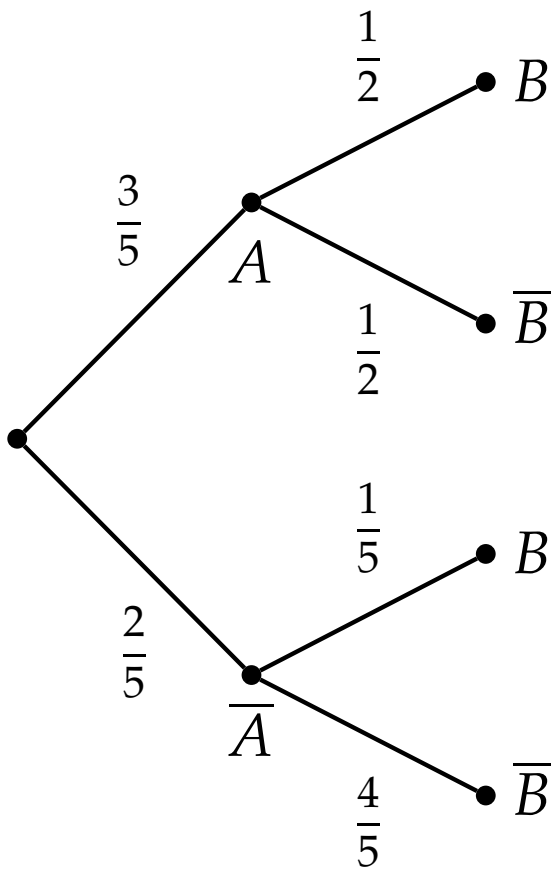
$$P_{\overline{B}}(\overline{A}) = \frac{P(\overline{A} \cap \overline{B})}{\overline{B}} = \frac{\frac{8}{25}}{\frac{31}{50}} = \frac{16}{31}$$

BY-SA

correction

2

a)



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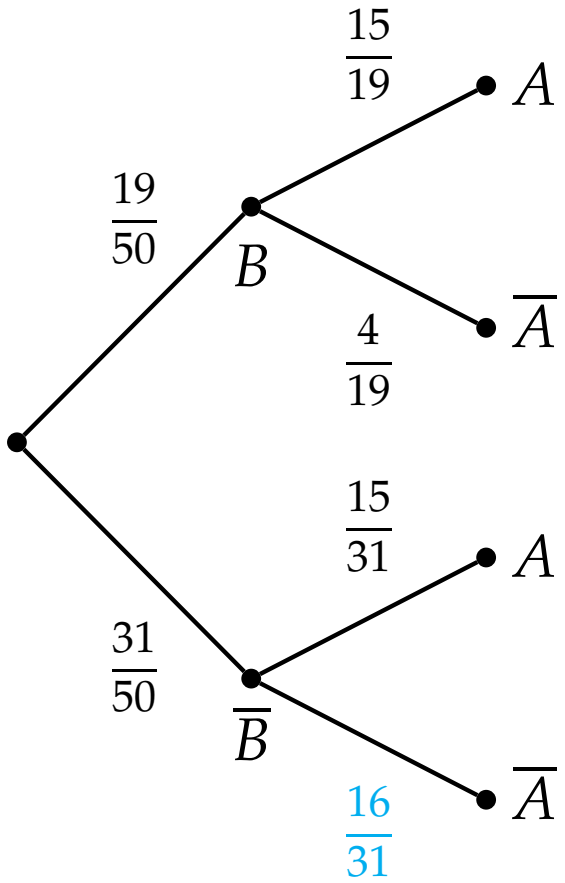

$$P_{\overline{B}}(\overline{A}) = \frac{P(\overline{A} \cap \overline{B})}{\overline{B}} = \frac{\frac{8}{25}}{\frac{31}{50}} = \frac{16}{31}$$

BY-SA