Simplify Boolean expression 8

Challenge 2

Simplify this Boolean expression:

$(A \vee B) \wedge (B \vee B) \wedge (B \vee A)$

The expression simplifies to:

- True (1)
- False (0)
- A
- B

Simplify Boolean expression 9

Challenge 2

Using the laws of Boolean algebra, simplify this Boolean expression:

$B \wedge (A \vee A) \vee B \wedge \neg A$

The expression simplifies to:

- B
- True (1)
- A
- False (0)

Quiz:
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Simplify Boolean expression 7

Challenge 2

Use the laws of Boolean algebra to simplify the Boolean expression below.

$(B \vee \neg B) \wedge (B \vee A)$

Which of the following options shows the simplest equivalent logic?

- 0
- 1
- $B \vee A$
- $B \vee \neg B \wedge A$

Quiz:
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Simplify Boolean expression 3

Challenge 1

Use the Boolean identities to simplify the Boolean expression below.

$A \vee (B \wedge 1)$

Which of the following options shows the simplest equivalent logic?

- A
- 0
- $A \vee B$
- $A \wedge B$
- B
- 1

Quiz:
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Simplify Boolean expression 5

Challenge 2

Use the laws of Boolean algebra to simplify the Boolean expression below.

$B \vee \neg B \wedge A$

Which of the following options shows the simplest equivalent logic?

- $A \vee B$
- $\neg B \vee A$
- A
- B

Quiz:
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Simplify Boolean expression 6

Challenge 2

Use the laws of Boolean algebra to simplify the Boolean expression below.

$(A \wedge \neg B) \vee (A \wedge B)$

Which of the following options shows the simplest equivalent logic?

- 1
- $A \wedge (B \vee \neg B)$
- $A \wedge B$
- A

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Simplify Boolean expression 1

Challenge 1

Use the Boolean identities to simplify the Boolean expression below.

$X \wedge (Y \vee 1)$

Which of the following options shows the simplest equivalent logic?

- Y
- 1
- 0
- X
- $X \wedge Y$
- $X \vee Y$

Quiz:
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Boolean identities and laws 1

Challenge 1

Boolean expressions can be manipulated using basic Boolean identities and laws. A Boolean identity is a statement of equivalence where the expression on the left of the equals sign has the same logic as the expression on the right.

Which of the following identities is **not** True?

- $A \vee 0 = A$
- $A \wedge \neg A = 0$
- $A \vee \neg A = 1$
- $A \wedge \neg A = 1$

Quiz:
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Simplify Boolean expression 11

Challenge 2

Using the laws of Boolean algebra, simplify this Boolean expression:

$\neg(\neg(A \wedge B)) \vee A \vee B \vee C$

The expression simplifies to:

- $A \vee B \vee C$
- $(A \wedge B) \vee C$
- False (0)
- $\neg C$

Quiz:
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Simplify Boolean expression 13

Challenge 2

There is more than one way to make use of the laws of Boolean algebra to simplify the expression below:

$(A \vee B) \wedge (B \vee C \wedge (D \vee \neg D))$

One option is:

$(A \vee B) \wedge (B \vee C \wedge (D \vee \neg D))$

$= (A \vee B) \wedge (B \vee C \wedge 1)$

$= (A \vee B) \wedge (B \vee C)$

$= B \vee (A \wedge C)$

Select a method from the options below that will also simplify the Boolean expression given above:

$(A \vee B) \wedge (B \vee C \wedge (D \vee \neg D))$

$= (A \vee B) \wedge (B \vee C \wedge 1)$

$= (A \vee B) \wedge (B \vee C)$

$= (A \wedge B) \vee (A \wedge C) \vee (B \wedge B) \vee (B \wedge C)$

$= (A \wedge B) \vee (A \wedge C) \vee B \vee (B \wedge C)$

$= (A \wedge B) \vee (A \wedge C) \vee B$

$= B \vee (A \wedge B) \vee (A \wedge C)$

$= B \vee (A \wedge C)$

$(A \vee B) \wedge (B \vee C \wedge (D \vee \neg D))$

$= (A \vee B) \wedge (B \vee C \wedge 1)$

$= (A \vee B) \wedge (B \vee C)$

$= (A \vee B) \wedge (A \vee C) \wedge (B \vee B) \wedge (B \vee C)$

$= (A \vee B) \wedge (A \vee C) \wedge 1 \wedge (B \vee C)$

$= (A \vee B) \wedge (A \vee C) \wedge (B \vee C)$

$= B \vee (A \vee C) \wedge (A \vee C)$

$= B \vee (A \wedge C)$