Boolean Algebra Homework

Read the directions on the Canvas assignment page.

1. Using truth tables, show that these two Boolean expressions are equivalent.

$$\neg((x \wedge y) \vee (\neg x \wedge z)) \equiv (\neg x \vee \neg y) \wedge (x \vee \neg z)$$

2. Show that these two Boolean expressions are equivalent by transforming one into the other using the properties of Boolean algebra. Justify each step by naming the property you used.

$$x \wedge z \vee \neg(\neg y \vee z) \vee x \wedge \neg z \equiv x \vee y \ \wedge \neg z$$

3. Use a Karnaugh map to minimize this Boolean expression.

$$z(wxy + wx\bar{y}) + (y + \bar{z})\bar{w}x + \bar{w}\bar{x}y + \bar{w}x\bar{y}z$$