I will give a proof for the following claim:

$$Pa, Pb \vdash \forall x(x = a \lor x = b \to Px)$$

I'll first show how to arrive at the proof. Then I'll go through the proof step-by-step according to the rules.

Assuming the premisses is usually a good idea.

Pa Pb

I need to prove the conclusion $\forall x(x=a \lor x=b \to Px)$ from these premisses.

Pa Pb

$$\frac{}{\forall x(x=a \lor x=b \to Px)}$$

I hope to obtain the conclusion by an application of ∀Intro.

$$Pa \qquad\qquad Pb$$

$$\dfrac{\overline{c = a \lor c = b \to Pc}}{\forall x(x = a \lor x = b \to Px)}$$

$c = a \lor c = b \to Pc$ will be arrived at by →Intro. So I assume $c = a \lor c = b$ and try to get Pc from it and from the other two assumptions.

$$Pa \qquad\qquad Pb$$

$$c = a \lor c = b$$

$$\dfrac{\dfrac{}{c = a \lor c = b \to Pc}}{\forall x(x = a \lor x = b \to Px)}$$

In order to derive something from $c = a \vee c = b$, I use $\vee$Elim. So I assume $c = a$ and $c = b$.

$$Pa \qquad c = a \qquad Pb \qquad c = b$$

$$c = a \vee c = b$$

$$\dfrac{\dfrac{}{c = a \vee c = b \to Pc}}{\forall x(x = a \vee x = b \to Px)}$$

Obtaining Pc by =Elim is now easy. Since Pc can be obtained in both cases, $\lor$Elim can be applied.

$$\dfrac{\dfrac{\dfrac{c=a \lor c=b \qquad \dfrac{Pa \qquad c=a}{Pc} \qquad \dfrac{Pb \qquad c=b}{Pc}}{Pc}}{c=a \lor c=b \to Pc}}{\forall x(x=a \lor x=b \to Px)}$$

…and yes the square brackets are still missing: $c = a \lor c = b$ is discharged according to →Intro and $c = a$ and $c = b$ are discharged according to ∨Elim.

$$\dfrac{\dfrac{\dfrac{[c=a \lor c=b] \qquad \dfrac{Pa \qquad [c=a]}{Pc} \qquad \dfrac{Pb \qquad [c=b]}{Pc}}{Pc}}{c=a \lor c=b \to Pc}}{\forall x(x=a \lor x=b \to Px)}$$

To make sure that everything is correct, I go through the proof in the offical order.

Pa and Pb, $c = a$ and $c = b$ are assumed.

$Pa \qquad c = a \qquad Pb \qquad c = b$

=Elim is applied in both cases to get Pc.

$$\frac{Pa \qquad c = a}{Pc} \qquad \frac{Pb \qquad c = b}{Pc}$$

$c = a \vee c = b$ is assumed.

$$c = a \vee c = b \qquad \frac{Pa \qquad c = a}{Pc} \qquad \frac{Pb \qquad c = b}{Pc}$$

$\lor$Elim can be applied and $c = a$ and $c = b$ are discharged in accordance with $\lor$Elim.

$$\dfrac{c = a \lor c = b \qquad \dfrac{Pa \qquad [c = a]}{Pc} \qquad \dfrac{Pb \qquad [c = b]}{Pc}}{Pc}$$

Now $\to$Intro is used to discharge $c = a \lor c = b$ and to get $c = a \lor c = b \to Pc$.

$$\dfrac{[c = a \lor c = b] \qquad \dfrac{Pa \qquad [c = a]}{Pc} \qquad \dfrac{Pb \qquad [c = b]}{Pc}}{\dfrac{Pc}{c = a \lor c = b \to Pc}}$$

The last step is an application of $\forall$Intro. All assumptions containing c have already been discharged and the conclusion $\forall x(x = a \lor x = b \to Px)$ also does not contain c; so the condition on constants is satisfied.

$$\dfrac{\dfrac{\dfrac{[c=a \lor c=b] \qquad \dfrac{Pa \qquad [c=a]}{Pc} \qquad \dfrac{Pb \qquad [c=b]}{Pc}}{Pc}}{c=a \lor c=b \to Pc}}{\forall x(x=a \lor x=b \to Px)}$$