The integration variable in the second part of the integral has been changed from $\vec{p}$ to $-\vec{p}$. The Jacobian of the transformation is unity, and the factor $E_p = \sqrt{|\vec{p}|^2 + m^2}$ doesn't change sign. This accounts for the stuff out front. Now what about the stuff in the exponential? Before the change of variable, the argument of the exponential was $ip_\mu x^\mu = i(-\vec{p}\cdot\vec{r}+p^0 t) = i(-\vec{p}\cdot\vec{r} + E_p t)$ since the original integral specified that $p^0 = E_p$. When you change the sign of $\vec{p}$, E_p remains fixed, so the exponential now looks like $i(\vec{p}\cdot\vec{r}+E_p t) = -i(-\vec{p}\cdot\vec{r}-E_p t)$. You would like to interpret this as a four vector dot product of the form $-i(-\vec{p}\cdot\vec{r}+p^0 t) = -ip_\mu x^\mu$ which clearly means you must now identify $p^0 = -E_p$.