PROOF OF FORMULA 3.361.2

$$\int_0^\infty \frac{e^{-qx}}{\sqrt{x}}\,dx = \sqrt{\frac{\pi}{q}}$$

Let $x = t^2$ to obtain

$$\int_0^\infty \frac{e^{-qx}}{\sqrt{x}}\,dx = 2\int_0^\infty e^{-qt^2}\,dt.$$

The change of variables $t = v/\sqrt{q}$ gives

$$2\int_0^\infty e^{-qt^2}\,dt = \frac{2}{\sqrt{q}}\int_0^\infty e^{-v^2}\,dv.$$

The result follows now from the value

$$\int_0^\infty e^{-t^2}\,dt = \frac{\sqrt{\pi}}{2}.$$