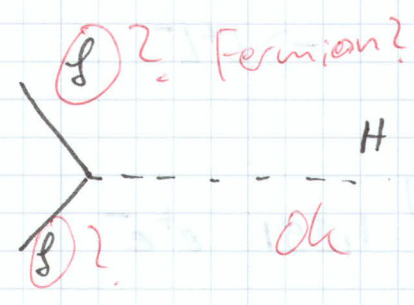
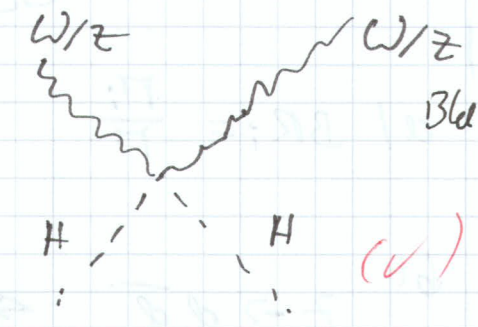
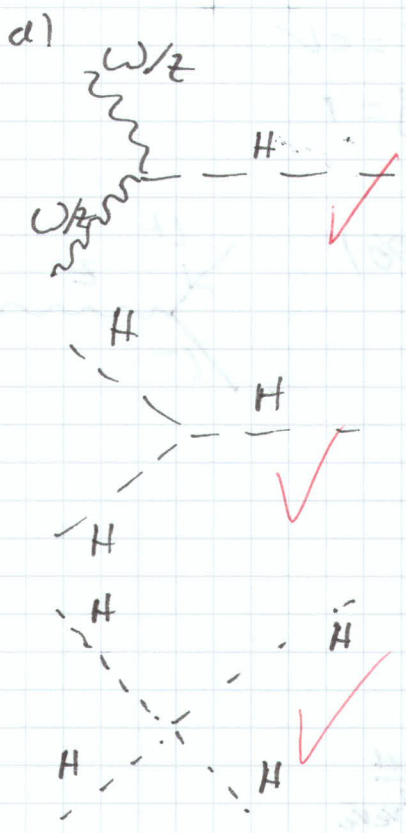
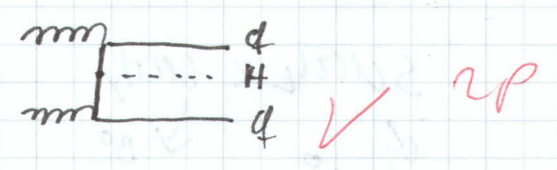
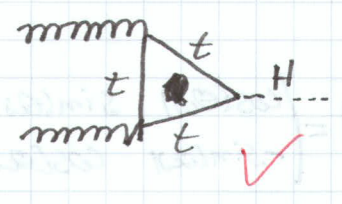
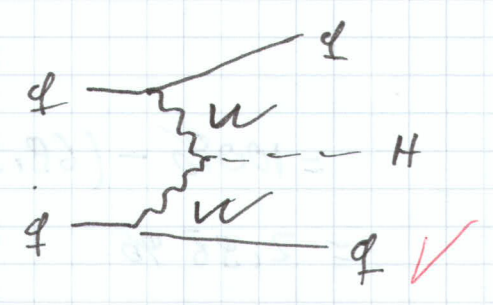
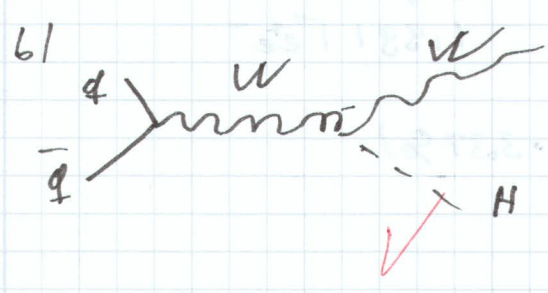


Aufgabe 2



2+1 P



c) Bottom - Antibottom \rightarrow Higgs-Kopplg \sim Masse
Haben größte Masse & sind nicht zu schwer ✓ 2P

d) Photonen sind masselos, können aber
über $\gamma \rightarrow e^+ e^-$ entstehen ✓ 2P

9P

Aufgabe

1)

$$a) BR_i = \frac{\Gamma_i}{\Gamma}$$

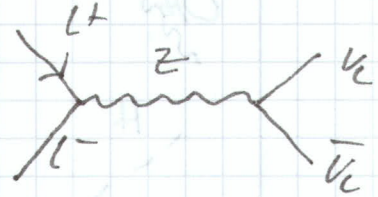
$$[\Gamma] = eV$$

$$[BR] = 1$$

b)

$$Z \rightarrow q \bar{q} \quad (68.9 \%)$$

$$\rightarrow L^+ L^- \quad (3.37 \%)$$



c)

$$1.991 \quad e^+ e^- \quad \nu_e \bar{\nu}_e$$

$$\Gamma_{inv} = N_\nu \Gamma_{\nu_e \bar{\nu}_e}$$

$$N_\nu = \frac{\Gamma_{inv}}{\Gamma_{\nu_e \bar{\nu}_e}} = \frac{\Gamma_{inv}}{\Gamma_{tot}} \underbrace{\frac{\Gamma_{tot}}{\Gamma_{\nu_e \bar{\nu}_e}}}_{1.991 \Gamma_{e^+ e^-}}$$

$$= 100\% - (68.9\% + 3 \cdot 3.37\%)$$

$$= 2.98\%$$

$$SU(2)_L \times U(1)_Y$$

$$\downarrow$$

$$\omega, \omega', \omega''$$

$$\downarrow$$

$$B^0$$

3 Bosonen

$$\begin{pmatrix} g \\ z^0 \end{pmatrix} = \begin{pmatrix} \cos(\theta_W) & \sin(\theta_W) \\ -\sin(\theta_W) & \cos(\theta_W) \end{pmatrix} \begin{pmatrix} B_0 \\ \omega_0 \end{pmatrix}$$

$$e = g \cdot \sin(\theta_W)$$

$$L_{em} = \frac{1}{137} \cdot L_0 \cdot \sin^2(\theta_W)$$

