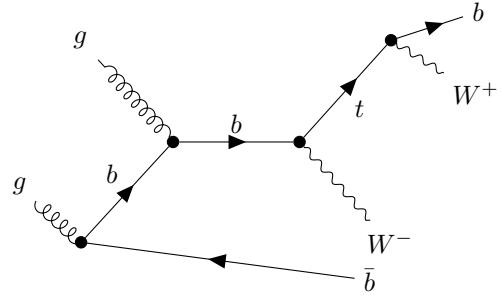
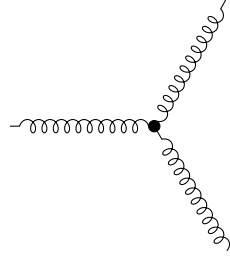


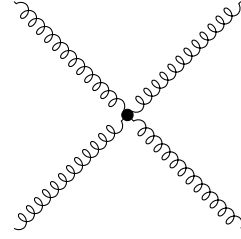
(a) Doubly-resonant diagram.



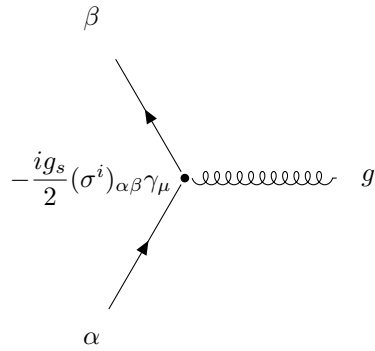
(b) Singly-resonant diagram.



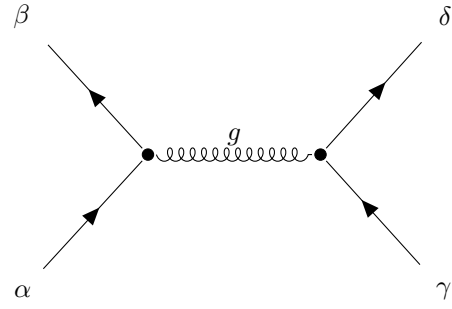
(a) Triple-boson vertex.



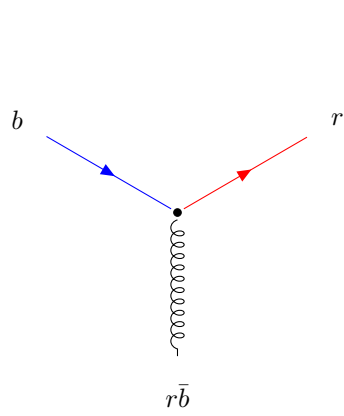
(b) Tetra-boson vertex.



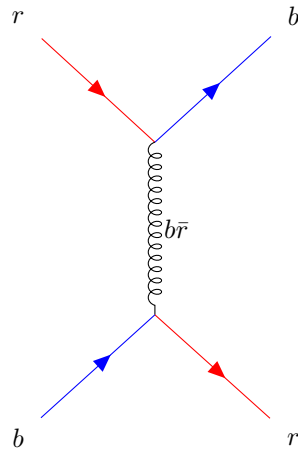
(a) Vertex factor of the interaction between nucleon and gauge field.



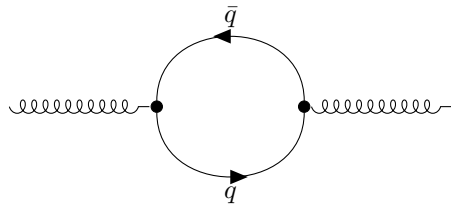
(b) Nucleon-nucleon interaction.



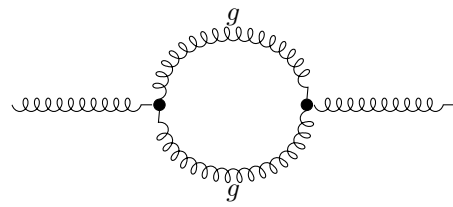
(a) Vertex factor of the color interaction between quark and gluon.



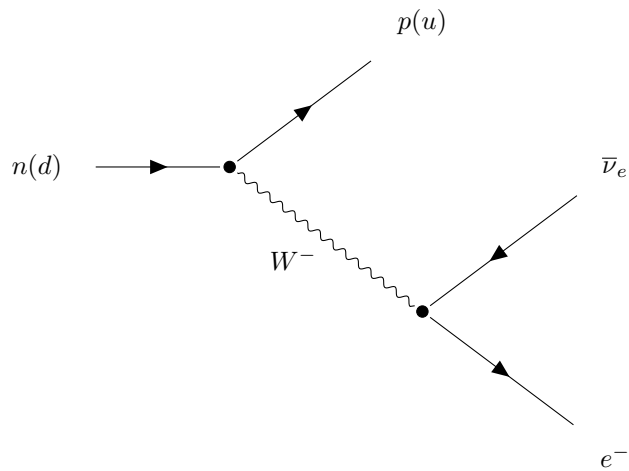
(b) Quark-quark color interaction:  $qq' \rightarrow qq'$ . The gluon carries the  $b\bar{r}$  color.



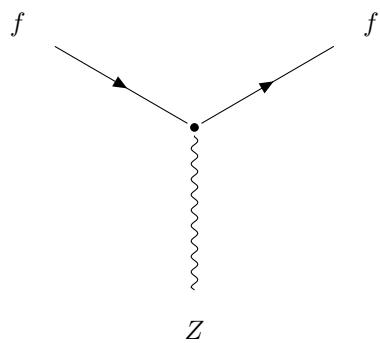
(a) Quark loop radiation.



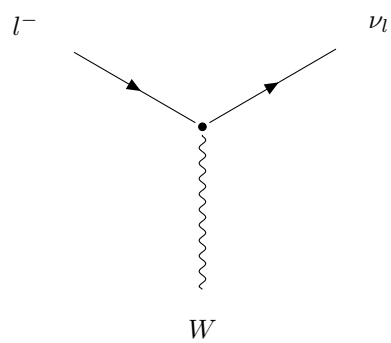
(b) Gluon loop radiation.



Feynman representation of the  $\beta$ -decay of the neutron:  $n \rightarrow p + e^- + \bar{\nu}_e$ .



(a) NC interaction vertex.



(b) CC interaction vertex.