Tree-level QCD Cross-sections

Reaction	$\dfrac{d\sigma}{d\hat{t}} = \dfrac{\pi\alpha^2}{\hat{s}^2} \times (\cdot)$
$\left.\begin{array}{l} u+d \to u+d \\ u+\bar{d} \to u+\bar{d} \end{array}\right\}$	$\dfrac{4}{9}\dfrac{\hat{s}^2+\hat{u}^2}{\hat{t}^2}$
$u+u \to u+u$	$\dfrac{4}{9}\left(\dfrac{\hat{s}^2+\hat{u}^2}{\hat{t}^2}+\dfrac{\hat{s}^2+\hat{t}^2}{\hat{u}^2}\right)-\dfrac{8}{27}\dfrac{\hat{s}^2}{\hat{u}\hat{t}}$
$u+\bar{u} \to d+\bar{d}$	$\dfrac{4}{9}\dfrac{\hat{t}^2+\hat{u}^2}{\hat{s}^2}$
$u+\bar{u} \to u+\bar{u}$	$\dfrac{4}{9}\left(\dfrac{\hat{s}^2+\hat{u}^2}{\hat{t}^2}+\dfrac{\hat{t}^2+\hat{u}^2}{\hat{s}^2}\right)-\dfrac{8}{27}\dfrac{\hat{u}^2}{\hat{s}\hat{t}}$
$u+u \to g+g$	$\dfrac{32}{27}\dfrac{\hat{u}^2+\hat{t}^2}{\hat{u}\hat{t}}-\dfrac{8}{3}\dfrac{\hat{u}^2+\hat{t}^2}{\hat{s}^2}$
$g+g \to u+\bar{u}$	$\dfrac{1}{6}\dfrac{\hat{u}^2+\hat{t}^2}{\hat{u}\hat{t}}-\dfrac{3}{8}\dfrac{\hat{u}^2+\hat{t}^2}{\hat{s}^2}$
$\left.\begin{array}{l} u+g \to u+g \\ \bar{u}+g \to \bar{u}+g \end{array}\right\}$	$\dfrac{\hat{u}^2+\hat{s}^2}{\hat{t}^2}-\dfrac{4}{9}\dfrac{\hat{u}^2+\hat{s}^2}{\hat{u}\hat{s}}$
$g+g \to g+g$	$\dfrac{9}{2}\left(3-\dfrac{\hat{u}\hat{t}}{\hat{s}^2}-\dfrac{\hat{s}\hat{u}}{\hat{t}^2}-\dfrac{\hat{s}\hat{t}}{\hat{u}^2}\right)$

Here $\hat{s}, \hat{t}$ and $\hat{u}$ are the kinematic variables for the parton-parton subprocess. In the expressions above the partons are taken to be massless. For heavy quarks of mass m, we define $\hat{u}_1 \equiv \hat{u} - m^2$ and $\hat{t}_1 \equiv \hat{t} - m^2$, and get ...

$u+\bar{u} \to b+\bar{b}$	$\dfrac{4}{9}\left(\dfrac{\hat{t}_1^2+\hat{u}_1^2}{\hat{s}^2}+\dfrac{2m^2}{\hat{s}}\right)$
$g+g \to b+\bar{b}$	$\dfrac{1}{8}\left(\dfrac{4}{3}-\dfrac{3\hat{t}_1\hat{u}_1}{s^2}\right)\left(\dfrac{\hat{t}_1}{\hat{u}_1}+\dfrac{\hat{u}_1}{\hat{t}_1}+\dfrac{4m^2\hat{s}}{\hat{u}_1\hat{t}_1}(1-\dfrac{m^2\hat{s}}{\hat{u}_1\hat{t}_1})\right)$