9. $\int 5x^2\sqrt{x^3-4}\,dx$

$u = x^3-4 \quad du = 3x^2\,dx$

$= 5\cdot\frac{1}{3}\int 3x^2\sqrt{x^3-4}\,dx$

$= \frac{5}{3}\int \sqrt{u}\,du$

$= \frac{5}{3}\int u^{\frac{1}{2}}\,du$

$= \frac{5}{3}\cdot\frac{u^{\frac{1}{2}+1}}{\frac{1}{2}+1} + C$

$= \frac{5}{3}\cdot\frac{u^{\frac{3}{2}}}{\frac{3}{2}} + C$

$= \frac{5}{3}\cdot\frac{2}{3}u^{3/2} + C$

$= \boxed{\frac{10}{9}(x^3-4)^{3/2} + C}$

8. (DONE RIGHT, NOT WATCHING JASON)

$\int (3x^2+6x)^{10}(x+1)\,dx$

$u = 3x^2+6x \quad du = (6x+6)\,dx$

$du = 6(x+1)\,dx$

$= \frac{1}{6}\int 6(3x^2+6x)^{10}(x+1)\,dx$

$= \frac{1}{6}\int u^{10}\,du$

$= \frac{1}{6}\cdot\frac{u^{11}}{11} + C$

$= \boxed{\frac{1}{66}(3x^2+6x)^{11} + C}$

10. $\int \frac{6x-21}{(x^2-7x+1)^4}\,dx$

$u = x^2-7x+1 \quad du = (2x-7)\,dx$

$= \int \frac{3(2x-7)}{(x^2-7x+1)^4}\,dx$

$= 3\int \frac{2x-7}{(x^2-7x+1)^4}\,dx$

$= 3\int \frac{1}{u^4}\,du$

$= 3\int u^{-4}\,du$

$= 3\cdot\frac{u^{-4+1}}{-4+1} + C$

$= 3\cdot\frac{u^{-3}}{-3} + C$

$= \frac{3u^{-3}}{-3} + C$

$= \frac{3}{-3u^3} + C$

$= \boxed{\frac{-1}{(x^2-7x+1)^3} + C}$