$$
\begin{aligned}
& \text { (12) } \int_{3(3 x+5)}^{(3 x+15)} \sqrt{x^{2}+10 x+4} d x \\
& \left\{\begin{array} { l } 
{ 3 u ^ { 1 / 2 } \cdot \frac { 1 } { 2 } d u } \\
{ 1 ^ { \frac { 3 } { 2 } } \int u ^ { 1 / 2 } d u }
\end{array} \left\{\begin{array}{l}
u=x^{2}+10 x+4 \\
d u=(2 x+10) d x \\
d u=2(x+5) d x \\
\frac{1}{2} u^{3 / 2}
\end{array}\right.\right. \\
& \frac{3}{2} \cdot \frac{u^{3 / 2}}{3 / 2}+C \\
& \frac{n^{3 / 2}+C}{\left(x^{2}+10 x+4\right)^{3 / 2}+C} \\
& \int x+2 \sqrt{(x-2} d x \\
& \frac{u}{+4}=\frac{x-2}{+4} \quad d u=d x \\
& \text { u+4) } x+2 \\
& \begin{array}{l}
\int(u+4) u^{1 / 2} d u \\
\int\left(u^{3 / 2}+4 u^{1 / 2}\right) d u \\
\frac{2 u^{5 / 2}}{5}+\frac{24}{3} u^{3 / 2}+C
\end{array} \\
& =\frac{2}{5}(x-2)^{5 / 2}+\frac{8}{3}(x-2)^{3 / 2}+C \\
& \int \frac{x^{2} d x}{\sqrt{x-4}} \quad \begin{array}{l}
u=x-4 \\
u+4=x
\end{array} d u=d x \\
& (u+4)^{2}=x^{2} \\
& \int \frac{u^{2}+8 u+16}{u^{1 / 2}} d u u^{2}+8 u+16=x^{2}
\end{aligned}
$$

