5) Find the indefinite integral.

$$\int \frac{dx}{\sqrt{x^2-6x-7}} = \int \frac{dx}{\sqrt{(x-3)^2-(4)^2}}$$

$$= \int \frac{du}{\sqrt{u^2-(4)^2}}$$

$$\cancel{= \arcsin \frac{u}{4} + C}$$

$$\cancel{= \boxed{\arcsin \frac{x-3}{4} + C}}$$

sorry - I was in a hurry!

see below under # 8

Evil Plan

1) Rewrite the denominator of the integrand by completing the square

$$x^2-6x-7 = (x^2-6x+(3)^2)-7-9$$

$$= (x-3)^2-16$$

$$= (x-3)^2-(4)^2$$

2) Set up inverse trig int.

$u = x-3$ $\quad a^2 = 16$

$\frac{du}{dx} = 1$ $\quad a = 4$

$dx = du$

$$\int f(u)du = F(u)+C$$

$(u = g(x)$, change of variables$)$

8) $$\int \frac{x+10}{x+2}\,dx$$

$$= \int \left(1 + \frac{8}{x+2}\right) dx$$

$$= x + 8\ln|x+2| + C$$

$$= \boxed{x + \ln(x+2)^8 + C}$$

Evil Plan

1) Simplify rational function by polynomial long division

$$\begin{array}{r} 1 + \frac{8}{x+2} \\ (x+2)\,\overline{)\,x+10} \\ -(x+2) \\ \hline 8 \end{array}$$

$$\int \frac{du}{\sqrt{u^2-4^2}} = \int \frac{\cancel{4\sec\theta\tan\theta}\,d\theta}{\cancel{4\tan\theta}}$$

$$= \int \sec\theta\, d\theta$$

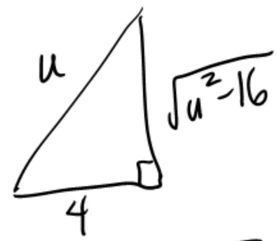
$$= \ln|\sec\theta + \tan\theta| + C$$

$$= \ln\left|\frac{u}{4} + \frac{\sqrt{u^2-16}}{4}\right| + C$$

3) Trig. Sub.

$u = 4\sec\theta$

$du = 4\sec\theta\tan\theta\,d\theta$



$$\sqrt{u^2-4^2} = \sqrt{(4\sec\theta)^2-16}$$

$$= \ln\left|\frac{x-3+\sqrt{(x-3)^2-16}}{4}\right| + C$$

$$\boxed{= \ln\left|\frac{x-3+\sqrt{x^2-6x-7}}{4}\right| + C}$$

$$= \sqrt{16\sec^2\theta - 16}$$

$$= \sqrt{16(\sec^2\theta - 1)}$$

$$= 4\sqrt{\tan^2\theta}$$

$$= 4\tan\theta$$