

$$\int \frac{1}{\sqrt{u}} du = 2\sqrt{u}.$$

$$= \frac{2u^{3/2}}{3} + \underline{2\sqrt{u}}.$$

$$u^{-1/2}$$

$$\frac{du^{1/2}}{1/2} = 2u^{1/2}.$$

$$= 2\sqrt{u}.$$

$$e^{x+1} \Rightarrow \frac{2(e^{x+1})^{3/2}}{3} + 2\sqrt{e^{x+1}} + C \cdot x^3.$$

$$= 2(e^{x+1})^{3/2} + 6\sqrt{e^{x+1}} + C.$$

then plug in limits. $\ln 5 \ln 2$

$$(2e^{\ln 5+1})^{3/2} + 6\sqrt{e^{\ln 5+1}} - (2e^{\ln 2+1})^{3/2} + 6\sqrt{e^{\ln 2+1}} = 20.$$

$$\text{ii } \int_1^e \ln x dx =$$

$$\int f g' = f g - \int f' g.$$

$$f(x) \ln x \rightarrow \frac{1}{x}.$$

$$g'(x) = 1$$

$$\text{so } g(x) = x.$$

$$= x \ln(x) - \int 1 dx.$$

$$\Rightarrow x \ln x - x + C.$$

$$x(\ln x - 1) + C.$$

plug in e & 1

$$(e \ln e - e) - (1 \ln 1 - 1) = 1.$$