(A) $\int_0^{\pi} \cos^2 t \, dt$ $\boxed{\frac{\pi}{2}}$

$= \int_0^{\pi} \frac{1+\cos 2t}{2} dt = \frac{t}{2} + \frac{\sin 2t}{4} \Big|_0^{\pi}$

$\cos^2 x = \frac{1+\cos 2x}{2}$

$\sin^2 x = \frac{1-\cos 2x}{2}$

(B) $\int_0^2 t^3 + 4t \, dt$ $\boxed{12}$

Posit.

$= \frac{1}{4}t^4 + 2t^2 \Big|_0^2$ ← neg.

$= \boxed{\frac{16}{4} + 8} - 0 + 0$

(C) $\int_1^3 \frac{1}{x+4} dx = \log(x+4) \Big|_1^3$

$= \log(7) - \log 5$

$= \boxed{\log(7/5)}$

(D) $\int_0^1 e^{7x} dt = \frac{e^{7x}}{7} + c \Big|_0^1$

$= \frac{e^7}{7} + \cancel{c} - \frac{e^0}{7} - \cancel{c} = \boxed{\frac{e^7}{7} - \frac{1}{7}}$

(E) $\int_1^2 \frac{\log(x)}{x} dx = \frac{(\log(x))^2}{2} \Big|_1^2$

$= \boxed{\log(2)^2/2}$

what F has the property $F' = \log x / x$

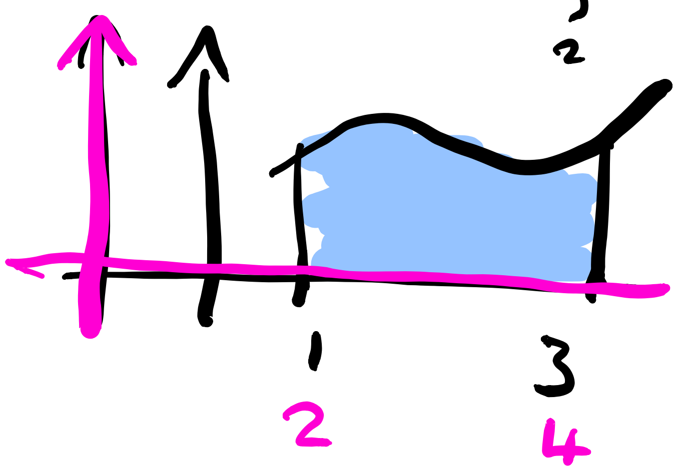
3

(F) $\int_1 x\sqrt{x+1}\,dx$

Peppered problem not easy

$$\int_2^4 (x-1)\sqrt{x}\,dx = \int_2^4 x^{3/2} - x^{1/2}\,dx$$

don't worry we learn



$$\int_2^4 x^{3/2} - x^{1/2}\,dx$$

$$\frac{2}{5}x^{5/2} - \frac{2}{3}x^{3/2}\Big|_2^4 = \ldots$$

$$\boxed{\int_a^b x^n\,dx = \frac{x^{n+1}}{n+1}\Big|_a^b}$$

works also for fractions