

You will have **two minutes** to evaluate each of the fifteen definite integrals that will be displayed one at a time on this screen. **All answers must be simplified.** At the end of the two minutes, all hands must go up and judges will grade your answers immediately. For each correct answer, you will receive one raffle ticket to be entered for prizes that will be drawn after dinner.

At most five participants will move to the finals—to be determined by the total number of correct answers and tiebreaking criteria if necessary. **Everyone moving to the finals will receive \$25**





$$\int p_{-} + p_{-}$$



$$\int p_- + p_-$$

$$= \int +$$

$$= \text{---} + \text{---}$$





$$\int \sin + \cos$$





$$\int \quad +$$

$$= - \int \quad = \quad + \quad =$$

$$= \quad -$$

$$= \quad \boxed{-}$$





$$\int \frac{\quad}{\quad + \ln \quad}$$



$$\int \frac{\quad}{\quad + \ln}$$

$$= \int \frac{\quad}{\quad + \quad} = \ln = -$$

$$= \arctan$$

$$= \boxed{-}$$





$$\int \frac{1}{(x + a)(x - b)}$$



$$\int \frac{1}{(x+h)(x-i)}$$

$$= \int \frac{1}{x+h} + \frac{1}{x-i}$$

$$= \ln|x+h| + \ln|x-i|$$

$$= \ln|x+h| + \ln|x-i| - \ln|x-h| = \ln \left| \frac{(x+h)(x-i)}{x-h} \right|$$





\int^{\ln}



$\int \ln$

"

#

integrate by parts:

=
=

=
=

$$= h \ln - \int \ln$$

$$= h - \ln =$$

$$\ln - = \ln -$$





$$\int \frac{\quad + \quad}{\quad}$$



$$\int \frac{\quad + \quad}{\quad}$$





$$\int \ln \frac{\quad}{\quad + \quad}$$



$$\int \frac{\ln}{+}$$

$$= - \int \frac{h}{-} = + = i$$

$$= \frac{\ln}{-}$$

$$= \frac{\ln - \ln}{-} = - \ln +$$





$$\int \frac{p}{+}$$



$$\int \tan$$

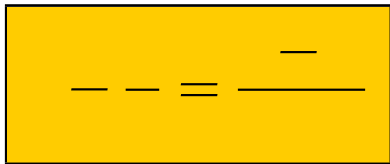


$$\int \tan$$

$$= \int \sec -$$

h i

$$= \tan -$$



=





$$\int - +$$



$$\int - +$$







$$\int \ln x \, dx = x \ln x - \int x \cdot \frac{1}{x} \, dx$$

integrate by parts: $= \ln x - \int 1 \, dx$

$$= x \ln x - \int 1 \, dx$$

$$= x \ln x - x = \boxed{x \ln x - x}$$





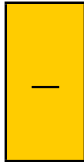


$$\int \frac{1}{\sqrt{x} + \sqrt{x+1}}$$

$$= \int \frac{1}{\sqrt{x} \sqrt{x+1}}$$

$$= \int \frac{1}{\sqrt{x(x+1)}} = \sqrt{x} + \dots = \frac{1}{\sqrt{x}}$$

$$= \frac{h}{i} = \frac{1}{-}$$







$$\int \sec \cdot \ln(\sec + \tan)$$



$$\int \sec \cdot \ln(\sec + \tan)$$

$$= \int^{\ln(+\sqrt{)}} = \ln(\sec + \tan) = \sec$$

$$= - \ln(+\sqrt{)} = \frac{\ln + \sqrt{}}{}$$





$$\int \tan + \sec$$



$$\int \tan + \sec$$

$$= \int \frac{d}{dx} (\tan) \quad \text{product rule}$$

$$= \tan$$

$$= \square$$