

**Table of Fundamental Integration Formulas
(TOUGHLOVE QUESTIONS)**

$$1.) \int K dx = Kx + c$$

$$2.) \int u^n du = \frac{u^{n+1}}{n+1} + c \quad \text{where } n \neq -1$$

$$3.) \int \frac{|u|}{u} du = |u| + c$$

$$4.) \int e^u du = e^u + c$$

$$5.) \int a^u du = \frac{a^u}{\ln a} + c$$

$$6.) \int \frac{du}{u} = \ln u + c$$

$$7.) \int \sin u du = -\cos u + c$$

$$8.) \int \sinh u du = \cosh u + c$$

$$9.) \int \cos u du = \sin u + c$$

$$10.) \int \cosh u du = \sinh u + c$$

$$11.) \int \sec^2 u du = \tan u + c$$

$$12.) \int \operatorname{sech}^2 u du = \tanh u + c$$

$$13.) \int \csc^2 u du = -\cot u + c$$

$$14.) \int \operatorname{csc} h^2 u du = -\operatorname{coth} u + c$$

$$15.) \int \sec u \tan u du = \sec u + c$$

$$16.) \int \operatorname{sech} u \tanh u du = -\operatorname{sech} u + c$$

$$17.) \int \csc u \cot u du = -\csc u + c$$

$$18.) \int \operatorname{csch} u \operatorname{coth} u du = -\operatorname{csch} u + c$$

$$19.) \int \frac{du}{\sqrt{1-u^2}} = \sin^{-1} u + c$$

$$20.) \int \frac{du}{\sqrt{1+u^2}} = \sinh^{-1} u + c = \ln(u + \sqrt{u^2 + 1}) + c$$

$$21.) \int \frac{du}{1+u^2} = \tan^{-1} u + c$$

$$22.) \int \frac{du}{\sqrt{u^2-1}} = \cosh^{-1} u + c = \ln(u + \sqrt{u^2-1}) + c$$

$$23.) \int \frac{du}{u\sqrt{u^2-1}} = \sec^{-1}|u| + c$$

$$24.) \int \frac{du}{u\sqrt{u^2+1}} = -\operatorname{csch}^{-1}|u| + c$$

$$25.) \int \frac{du}{u\sqrt{1-u^2}} = -\operatorname{sech}^{-1} u + c$$

$$26.) \int \frac{du}{1-u^2} = \begin{cases} \tanh^{-1} u + c & \text{if } |u| < 1 \\ \operatorname{coth}^{-1} u + c & \text{if } |u| > 1 \end{cases} = \frac{1}{2} \ln \left| \frac{1+u}{1-u} \right| + c \quad \text{if } u \neq 1$$

$$27.) \int |u| du = \frac{u|u|}{2} + c$$