$$\int \frac{1}{1+4x^2}\,dx = \frac{1}{2}\int \frac{1}{1+(2x)^2}\cdot 2\,dx = \frac{1}{2}\,\text{arctg}(2x) + c$$

$$\int_0^{1/2} \underbrace{\frac{1}{1+4x^2}}_{f(x)}\,dx = \underbrace{\frac{1}{2}\,\text{arctg}(2x)}_{G(x)}\Bigg|_{0\,(a)}^{1/2\,(b)} = \underbrace{\frac{1}{2}\,\text{arctg}\left(2\cdot\frac{1}{2}\right)}_{G(b)} - \underbrace{\frac{1}{2}\,\text{arctg}(2\cdot 0)}_{G(a)}$$

$$= \frac{1}{2}\,\text{arctg}\,1 - \frac{1}{2}\,\text{arctg}\,0 = \frac{1}{2}\cdot\frac{\pi}{4} - \frac{1}{2}\cdot 0 = \frac{\pi}{8}$$

$$\int_a^b f(x)\,dx = G(x)\Big|_a^b = G(b) - G(a)$$

$$\int_0^{1/2} \frac{1}{1+4x^2}\,dx = \frac{1}{2}\int_0^{1/2} \frac{1}{1+(2x)^2}\cdot 2\,dx = \frac{1}{2}\,\text{arctg}(2x)\Big|_0^{1/2} = \dots = \frac{\pi}{8}$$

$$\int_1^e \underbrace{\frac{1}{6x}}_{f(x)}\,dx = \frac{1}{6}\int_1^e \frac{1}{x}\,dx = \underbrace{\frac{1}{6}\log|x|}_{G(x)}\Bigg|_{1\,(a)}^{e\,(b)} = \underbrace{\frac{1}{6}\big(\log|e|}_{G(b)}-\overbrace{\log|1|}^{G(a)}\big) = \frac{1}{6}$$

$$\int_0^{\frac{\pi}{18}} \cos(9x)\,dx = \frac{1}{9}\int_0^{\frac{\pi}{18}} \cos(9x)\cdot 9\,dx = \frac{1}{9}\,\mathrm{sen}(9x)\Big|_0^{\frac{\pi}{18}} =$$

$$= \frac{1}{9}\,\mathrm{sen}\left(9\cdot\frac{\pi}{18}\right) - \frac{1}{9}\,\mathrm{sen}(9\cdot 0) =$$

$$= \frac{1}{9}\,\mathrm{sen}\left(\frac{\pi}{2}\right) - \frac{1}{9}\cdot 0 = \frac{1}{9}$$

$$\int_0^1 \sqrt{7x}\,dx = \sqrt{7}\int_0^1 \sqrt{x}\,dx = \sqrt{7}\cdot\frac{2}{3}x^{\frac{3}{2}}\Big|_0^1 = \frac{2\sqrt{7}}{3}$$

$$\int_0^{\frac{1}{10}} \frac{1}{\sqrt{1-25x^2}}\,dx = \int_0^{\frac{1}{10}} \frac{1}{\sqrt{1-(5x)^2}}\,dx = \frac{1}{5}\int_0^{\frac{1}{10}} \frac{1}{\sqrt{1-(5x)^2}}\cdot 5\,dx$$

$$= \frac{1}{5}\operatorname{arcsen}(5x)\Big|_0^{\frac{1}{10}} = \frac{1}{5}\operatorname{arcsen}\left(5\cdot\frac{1}{10}\right) - \frac{1}{5}\operatorname{arcsen}(5\cdot 0) =$$

$$= \frac{1}{5}\operatorname{arcsen}\left(\frac{1}{2}\right) - \frac{1}{5}\operatorname{arcsen}(0) = \frac{1}{5}\cdot\frac{\pi}{6} - \frac{1}{5}\cdot 0 = \frac{\pi}{30}$$

$$\int_0^{\frac{\pi}{16}} \frac{1}{\cos^2(4x)}\,dx = \frac{1}{4}\int_0^{\frac{\pi}{16}} \frac{1}{\cos^2(4x)}\cdot 4\,dx = \frac{1}{4}\,tg(4x)\Big|_0^{\frac{\pi}{16}} = \frac{1}{4}\,tg\left(4\cdot\frac{\pi}{16}\right) - \frac{1}{4}\,tg(4\cdot 0)$$

$$= \frac{1}{4}\,tg\left(\frac{\pi}{4}\right) - \frac{1}{4}\,tg(0) = \frac{1}{4}$$

$$\int_1^{e^2} \frac{1}{8x}\,dx = \frac{1}{8}\int_1^{e^2} \frac{1}{x}\,dx = \frac{1}{8}\log|x|\Big|_1^{e^2} = \frac{1}{8}\log|e^2| - \frac{1}{8}\log|1| =$$

$$= \frac{1}{8}\cdot 2\log e - \frac{1}{8}\log 1 = \frac{1}{4}$$

$$\int_{\frac{\pi}{21}}^{\frac{\pi}{14}} \operatorname{sen}(7x)\,dx = \frac{1}{7}\int_{\frac{\pi}{21}}^{\frac{\pi}{14}} \operatorname{sen}(7x)\cdot 7\,dx = -\frac{1}{7}\cos(7x)\Big|_{\frac{\pi}{21}}^{\frac{\pi}{14}}$$

$$= -\frac{1}{7}\cos\left(7\cdot\frac{\pi}{14}\right) + \frac{1}{7}\cos\left(7\cdot\frac{\pi}{21}\right)$$

$$= \cancel{-\frac{1}{7}\cos\left(\frac{\pi}{2}\right)} + \frac{1}{7}\cos\left(\frac{\pi}{3}\right) = \frac{1}{7}\cdot\frac{1}{2} = \frac{1}{14}$$