

$$1) \alpha) \int_3^5 x dx = \left[\frac{x^2}{2} \right]_3^5 = \frac{5^2}{2} - \frac{3^2}{2} = 8$$

$$\beta) \int_0^1 \frac{2x}{x^2+1} dx = \left[\ln(x^2+1) \right]_0^1 = \ln 2 - \ln 1 = \ln 2$$

$$2) \int_1^3 2x dx = \left[x^2 \right]_1^3 = 3^2 - 1^2 = 8$$

$$3) \int_{-2}^4 x^2 dx = \left[\frac{x^3}{3} \right]_{-2}^4 = \frac{4^3}{3} - \frac{(-2)^3}{3} = \frac{72}{3} = 24$$

$$4) \int_9^{16} \frac{1}{2\sqrt{x}} dx = \left[\sqrt{x} \right]_9^{16} = \sqrt{16} - \sqrt{9} = 1$$

$$5) \int_{\frac{1}{2}}^1 \frac{1}{x^2} dx = \left[-\frac{1}{x} \right]_{\frac{1}{2}}^1 = -\frac{1}{1} - \left(-\frac{1}{\frac{1}{2}} \right) = -1 + 2 = 1$$

$$6) \int_0^{\frac{\pi}{2}} \eta \mu x dx = \left[-\sigma \nu x \right]_0^{\frac{\pi}{2}} = -\sigma \nu \frac{\pi}{2} - (-\sigma \nu 0) = 1$$

$$7) \int_0^{\frac{\pi}{6}} \sigma \nu x dx = \left[\eta \mu x \right]_0^{\frac{\pi}{6}} = \eta \mu \frac{\pi}{6} - \eta \mu 0 = \frac{1}{2}$$

$$8) \int_0^{\frac{\pi}{4}} \frac{1}{\sigma \nu^2 x} = \left[\varepsilon \varphi x \right]_0^{\frac{\pi}{4}} = \varepsilon \varphi \frac{\pi}{4} - \varepsilon \varphi 0 = 1$$

$$9) \int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \frac{1}{\eta \mu^2 x} = \left[-\sigma \varphi x \right]_{\frac{\pi}{4}}^{\frac{\pi}{2}} = -\sigma \varphi \frac{\pi}{2} - \left(-\sigma \varphi \frac{\pi}{4} \right) = 1$$

$$10) \int_0^1 e^x dx = \left[e^x \right]_0^1 = e^1 - e^0 = e - 1$$

$$11) \int_1^e \frac{1}{x} dx = \left[\ln x \right]_1^e = \ln e - \ln 1 = 1$$

$$12) \int_0^2 3^x dx = \left[\frac{3^x}{\ln 3} \right]_0^2 = \frac{3^2}{\ln 3} - \frac{3^0}{\ln 3} = \frac{8}{\ln 3}$$

$$13) \int_1^2 \frac{1}{x^4} dx = \left[\frac{x^{-3}}{-3} \right]_1^2 = -\frac{1}{24} - \frac{1}{-3} = \frac{7}{24}$$

$$14) \int_0^1 \sqrt{x} dx = \left[\frac{2x^{\frac{3}{2}}}{\frac{3}{2}} \right]_0^1 = \frac{2 \cdot 1^{\frac{3}{2}}}{\frac{3}{2}} - \frac{2 \cdot 0^{\frac{3}{2}}}{\frac{3}{2}} = \frac{2}{3}$$

$$15) \int_0^\pi \eta \mu 3x dx = \left[\frac{-\sigma \nu 3x}{3} \right]_0^\pi = \frac{-\sigma \nu 3\pi}{3} - \frac{-\sigma \nu 0}{3} = \frac{2}{3}$$

$$16) \int_0^{\frac{\pi}{16}} \frac{1}{\sigma \nu^2 4x} dx = \left[\frac{\varepsilon \phi 4x}{4} \right]_0^{\frac{\pi}{16}} = \frac{\varepsilon \phi 4 \frac{\pi}{16}}{4} - \frac{\varepsilon \phi 0}{4} = \frac{1}{4}$$

$$17) \int_1^2 \frac{1}{6x} dx = \left[\frac{\ln|6x|}{6} \right]_1^2 = \frac{\ln|12|}{6} - \frac{\ln|6|}{6} \stackrel{\ln|12| - \ln|6| = \ln 2}{=} \frac{\ln 2}{6}$$

$$18) \int_{-2}^{-1} \frac{1}{2x} dx = \left[\frac{\ln|2x|}{2} \right]_{-2}^{-1} = \frac{\ln|2(-1)|}{2} - \frac{\ln|2(-2)|}{2} \stackrel{\ln 2 - \ln 4 = \ln \frac{2}{4} = \ln \frac{1}{2} = -\ln 2}{=} = -\frac{\ln 2}{2}$$

$$19) \int_0^1 6e^{3x} dx = \left[\frac{\cancel{6}^2 e^{3x}}{\cancel{3}} \right]_0^1 = 2e^{3 \cdot 1} - 2e^{3 \cdot 0} = 2e^3 - 2$$

$$20) \int_1^2 2^{4x-2} \ln 2 dx = \left[\frac{2^{4x-2}}{\frac{4}{\ln 2}} \right]_1^2 = \frac{2^{4 \cdot 2 - 2}}{\frac{4}{\ln 2}} - \frac{2^{4 \cdot 1 - 2}}{\frac{4}{\ln 2}} = 15$$

$$21) \int_{-1}^1 \frac{2x}{x^2+3} dx = \left[\ln(x^2+3) \right]_{-1}^1 = \ln(1^2+3) - \ln((-1)^2+3) = 0$$

$$22) \int_{\frac{\pi}{6}}^{\frac{\pi}{2}} \frac{\sigma \nu v x}{\sqrt{\eta \mu x}} dx = \left[2\sqrt{\eta \mu x} \right]_{\frac{\pi}{6}}^{\frac{\pi}{2}} = 2\sqrt{\eta \mu} \frac{\pi}{2} - 2\sqrt{\eta \mu} \frac{\pi}{6} \stackrel{2-2\sqrt{\frac{1}{2}}=2-\frac{2}{\sqrt{2}}=2-\frac{2\sqrt{2}}{2}}{=} 2-\sqrt{2}$$