1) $y=0 \quad y=4$
$y=4(x-3)^2$ | $y=\frac{4x^2}{2} \quad y=2x^2 \quad x=\sqrt{\frac{y}{4}} \quad \int_0^3 \sqrt{\frac{y}{4}} = 2\sqrt{3} \quad \frac{1}{2}\cdot 2\sqrt{3} \Rightarrow \sqrt{3}$

~~3)~~ ~~$y=0 \quad x=3$~~
~~$y=4(x-3)^2$~~ $\int_0^c \sqrt{\frac{y}{4}} = \frac{\sqrt{3}}{2} \rightarrow \int_0^c \sqrt{\frac{y}{4}}\,dy = \frac{c^{\frac{3}{2}}}{3} \rightarrow \frac{c^{\frac{3}{2}}}{3} = \frac{\sqrt{3}}{2}$ D//

2) $\int \frac{ax+b}{x^2+cx+0}\,dx = \ln(|x+2|) + 3\ln(|x-3|)$. C//

$\frac{ax+b}{x^2+cx+0} = \frac{1}{x+2} + \frac{3}{x-3} = \frac{ax+b}{x^2+cx+0} = \frac{4x+3}{x^2-x-6}$

$a=4$
$B=3$
$C=-1$
$D=-6$

3) $y=\frac{1}{2x^2+3} \int \frac{1}{2x^2+3}\,dx \int \frac{\sqrt{3}}{\sqrt{2}(3u^2+3}\,du \int \frac{1}{u^2+1}\,du = \frac{\arctan(u)}{\sqrt{2}\sqrt{3}}$

↳ $\frac{\arctan\left(\frac{\sqrt{2}x}{\sqrt{3}}\right)}{\sqrt{2}\sqrt{3}} \rightarrow \frac{\arctan\left(\frac{\sqrt{2}x}{\sqrt{3}}\right)}{\sqrt{2}\sqrt{3}} + C \Rightarrow \frac{\pi}{\sqrt{2}\sqrt{3}}$

$\frac{\pi}{\sqrt{6}} \rightarrow \frac{\pi}{\sqrt{6}} \cdot \frac{\sqrt{6}}{\sqrt{6}} \quad \frac{\pi\sqrt{6}}{\sqrt{6}\sqrt{6}} \rightarrow \frac{\pi\sqrt{6}}{6}$ E//

4) $2x^2 + \frac{y^2}{3} = 9 \; e \; x \geq 0 \qquad A = \frac{\pi \cdot r^2}{2} \qquad A = \frac{\pi \cdot \sqrt{3}\sqrt{9-2x^2}}{2} = \frac{\pi\sqrt{27-6x^2}}{2}$

$y = \sqrt{3}\sqrt{9-2x^2} \Rightarrow \sqrt{3}\sqrt{9-2x^2} = 0 \rightarrow x = \frac{3}{\sqrt{2}}$

X X

5) $\frac{dy}{dx} = \frac{\cos\left(\frac{x}{3}\right)}{2\sqrt{\operatorname{sen}\left(\frac{x}{3}\right)+3}}$ $\quad \frac{3}{2}\int \frac{1}{\sqrt{u}}\,du = 2\sqrt{u} \Rightarrow$ E//

$3\sqrt{\operatorname{sen}\left(\frac{x}{3}\right)+3}+c$

$3\sqrt{\operatorname{sen}\left(\frac{x}{3}\right)+3}+c \Rightarrow 3\sqrt{3}+c=0 \Rightarrow c=-3\sqrt{3}$

4) $2x^2+\frac{y^2}{3}=9$

$y=9\cdot 2x^2\cdot 3$

$y=\sqrt{9-2x^2}\cdot 3$

$y=\sqrt{27-6x^2} = R$ $\quad \sqrt{27-6x^2}=0 \Rightarrow \frac{3}{\sqrt{2}}$

$\int_0^{\frac{3}{\sqrt{2}}} \pi \cdot \frac{27-6x^2}{2}$ E//

$\frac{27\pi}{2}\int 1\,dx - 3\pi\int x^2\,dx \quad \int \frac{\pi(27-6x^2)}{2}\,dx$

$\frac{27\pi}{\sqrt{2}}$

6) $F(1)=2 \quad f(-1)=?$

$F(2)=2$

$f(2)=2$

$E^{2a+c}=2$

$2a+c=\ln 2$

$f(x) = e^{1x+\ln\frac{2}{2}}$

$f(x) = \frac{2}{2}e^{1x}$

$\frac{dy}{dx}=ay$ ✗

$\frac{dy}{y}=a\,dx$

$\int\frac{1}{y}\,dy=\int a\,dx$

$\ln y = ax+c$

$x = e^{ax+c}$

$f(1)=2$

$e^{1a+c}=2$

$1a+c=\ln 2$

$\begin{cases} 1a+c=\ln 2 \\ 2a+c=\ln 2 \end{cases}$

$\begin{cases} -1a-c=-\ln 2 \\ 2a+c=\ln 2 \end{cases}$

$a=\ln 1$

$a=1$

$1\cdot 1+c=\ln 2$

$2+c=\ln 2$

$c=\ln\frac{2}{2}$

$f(-1)=e^{\ln 2}$ ✗

✗

6) $\frac{dy}{dx} = ay$ $\int \frac{1}{y} dx \int a dx$ $\ln(y) = ax + c$ $y = e^{ax+c}$ $F(1)=2$ $F(-1)=?$ $F(2)=2$

$\frac{dy}{y} = a dx$ $f(1)=2$ $e^{a+c}=2$ $e^{2a+c}=2$ $a+c=\ln 2$ $2a+c=\ln 2$ $a=0$ $c=\ln 2$

$f(x) = e^{\ln 2} = 2 = 2^3 \cdot 2^{-3} = 2$

E//

$e^{0x+\ln 2}$