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A. Kalkulus.

1. $\int x^7\,dx = \frac{1}{7+1}x^{7+1}+C$

$= \frac{1}{8}x^8+C$

2. $\int \frac{1}{x^3}\,dx = \int x^{-3}\,dx$

$= \frac{1}{-3+1}x^{-3+1}+C$

$= \frac{1}{-2}x^{-2}+C$

$= -\frac{1}{2}\cdot\frac{1}{x^2}+C$

$= -\frac{1}{2x^2}+C$

3. $\int \sqrt[3]{x^2}\,dx = \int x^{\frac{2}{3}+1}+C$

$= \frac{1}{\frac{2}{3}+1}x^{\frac{2}{3}+1}+C$

$= \frac{1}{5/3}x^{\frac{5}{3}}+C$

$= \frac{3}{5}x^{5/3}+C$

4. $\int \frac{4}{t}\,dt = \int 4\,\frac{1}{t}\,dt$

$= 4\int\frac{1}{t}\,dt$

$= 4\ln|t|+C$

5. $\int (x^3-3x-9)\,dx = \frac{1}{3+1}x^{3+1}-3\,\frac{1}{1+1}x^{1+1}-9\cdot\frac{1}{0+1}x^{0+1}+C$

$= \frac{1}{4}x^4-3\,\frac{1}{2}x^2-9x+C$

$= \frac{1}{4}x^4-\frac{3}{2}x^2-9x+C$

6. $\int (2-y^2)^2\,dy = \int 4-4y^2+y^4\,dy$

$= 4\,\frac{1}{0+1}y^{0+1}-4\,\frac{1}{2+1}y^{2+1}-\frac{1}{4+1}y^{4+1}+C$

$= 4x-\frac{4}{3}y^3-\frac{1}{5}y^5+C$

B.

7. $\int 2x\,(x^2+1)^7\,dx = \int \cancel{2x}\cdot u^7\,\frac{du}{\cancel{2x}}$

$= \int u^7\,du$

$= \frac{1}{8}u^8+C$

$= \frac{1}{8}(x^2+1)^8+C$

$u = x^2+1$

$\frac{du}{dx} = 2x$

$dx = \frac{du}{2x}$

8. $\int \frac{\sin\sqrt{x}}{\sqrt{x}}\,dx$

$u = \sqrt{x}$

$\frac{du}{dx} = \frac{1}{2\sqrt{x}}$

$du = \frac{dx}{2\sqrt{x}}$

$2du = \frac{dx}{\sqrt{x}}$

$= \int \sin u\cdot 2\,du$

$= 2\int \sin u\,du$

$= -2\cos u+C$

$= -2\cos\sqrt{x}+C$

9. $\cos^2 x\,\sin x\,dx = \int u^2\cdot\cancel{\sin x}\cdot -\frac{du}{\cancel{\sin x}}$

$u = \cos x$

$\frac{du}{dx} = -\sin x$

$dx = \frac{du}{\sin x}$

$= -\int u^2\,du$

$= -\frac{1}{3}u^3+C$

$= -\frac{1}{3}\cos^3 x+C$

10. $\int \frac{3x\,dx}{\sqrt{4x^2+7}} = \int \frac{3x\cdot dx}{u^{1/2}}$

$u = 4x^2+7$

$\frac{du}{dx} = 8x$

$dx = \frac{du}{8x}$

$= \int 3x\cdot\frac{dx}{8x}\,u^{-1/2}$

$= \int \frac{3}{8}\cdot du\cdot u^{-1/2}$

$= \frac{3}{8}\cdot\frac{u}{-\frac{1}{2}+1}+C$

$= \frac{3}{8}\cdot\frac{u^{1/2}}{1/2}+C$

$= \frac{3}{8}\cdot 2u^{1/2}+C$

$= \frac{3}{4}\sqrt{u}+C$

$= \frac{3}{4}\sqrt{4x^2+7}+C$