5.6: 2, 3, 5, 9, 11, 13, 18, 25, 28, 34

5.7: 1, 2, 7, 11, 15, 17, 21, 25

5.6:

2:
$\int x \cos x dx$
$u = x, v' = \cos x dx$
$u' = 1, v = \sin x \int u \cdot v' = u \cdot v - \int u' \cdot v$
$\int x \cdot \cos x dx = x \cdot \sin x - \int 1 \cdot \sin x = x \cdot \sin x - \cos x$

3:
$\int x \cos 5x dx$
$u = \cos 5x, v = \frac{x^2}{2}$
$u' = -5 \sin 5x, v' = x$
$= uv - \int v \cdot u'$
$= \frac{\cos 5x \cdot x^2}{2} - \int \frac{x^2 \cdot -5 \sin 5x}{2} = \frac{\cos 5x + 5x \sin 5x}{25}$

5:
$\int x \cdot \mathrm{e}^{\frac{x}{2}} dr \; u = x, v = 2\mathrm{e}^{\frac{x}{2}}$
$u' = 1, v' = \mathrm{e}^{\frac{x}{2}}$

$2x\mathrm{e}^{\frac{x}{2}} - \int 2\mathrm{e}^{\frac{x}{2}}$
$= 2x\mathrm{e}^{\frac{x}{2}} - 4\mathrm{e}^{\frac{x}{2}}$
$= (2x - 4) \cdot \mathrm{e}^{\frac{x}{2}}$
$2x\mathrm{e}^{\frac{x}{2}}$

9:
$u = \ln \sqrt[3]{x}, v = x$
$u' = \frac{1}{3x}, v' = 1$
$\ln \sqrt[3]{x} \cdot x - \int \frac{x}{3x} dx$
$= x \ln \sqrt[3]{x} - \frac{x}{3}$

13:
$u = \sin 3x, v = \frac{e^{2x}}{2}$
$u' = 3\cos 3x, v' = e^{2x}$
$\frac{e^{2x}\sin 3x}{2} - \int \frac{3e^{2x}\cos 3x}{2}$
$= \frac{e^{2x}\cdot(2\sin 3x - 3\cos 3x)}{13}$

18:
$u = \ln(x), v = 2\sqrt{x}$
$u' = frac1x, v' = \frac{1}{\sqrt{x}}$
$2\ln x\sqrt{x} - \int \frac{2\sqrt{x}}{x}$
$= 2\ln x\sqrt{x} - 4\sqrt{x}$

25:
$y = \sqrt{x}$
$y' = \frac{x'}{2\sqrt{x}}$
$2\sqrt{x}y' = x'$
$2ydy = dx$

$\int \cos y \cdot 2y\, dy = 2\int \cos y \cdot y\, dy$
$u = y, v = \sin(y)$
$u' = 1, v' = \cos(y)$
$= 2(y \cdot \sin y - \int \sin y)$
$= 2(y \cdot \sin y + \cos y)$
$= 2(\sqrt{x}\sin\sqrt{x} - \cos\sqrt{x})$

28:
$\int e^{\cos t} \cdot \sin 2t\, dt$
$= 2\int e^{\cos t}\sin t\cos t\, dt$
$y = \cos t, dy = -\sin t\, dt$
$= -2\int e^{y} \cdot y\, dy$
$u = y, v = e^{y}$
$u' = 1, v' = e^{y}$
$= y \cdot e^{y} - \int e^{y}$
$= -2(y \cdot e^{y} - e^{y})$

34:
$\int x^2 \sin 2x\, dx$

$y = x^2$
$dy = 2x\,dx$
$\int \cos y^2\,dy = \sin y^2$
$= \sin x^{2^2}$

5.7: 1, 2, 7, 11, 15, 17, 21, 25

1:
$\int \sin^3 x\,dx \cdot \int \cos^2 x\,dx$
$\int \sin^2 x \sin x \cos^2 x\,dx$
$\int (1 - \cos^2 x)\cos^2 x \sin x\,dx$
$y = \cos x$
$dy = -\sin x\,dx$
$= \int (1 - y^2)y^2 \cdot -dy$
$= -\int (y^2 - y^4)\,dy$
$= -\frac{y^3}{3} + \frac{y^5}{5} + C$
$= -\frac{\cos^3 x}{3} + \frac{\cos^5 x}{5} + C$

2:
$\int \cos^5 x\,dx$
$\cos^2 x = (1 - \sin^2 x)$
$\int (1 - \sin^2 x)^2 \cdot \cos x\,dx$
$y = \sin x$
$dy = -\cos x\,dx$
$= \int (1 - y^2) \cdot -dy$
$= -\int (1 - y^2)\,dy$
$= -(y + \frac{y^3}{3})$
$= -(\sin x + \frac{\sin^3 x}{3})$

7:
$\tan^2 x = \sec^2 x - 1$
$\tan x = -\sqrt{\sec^2 x - 1}$
$u = \sec x$
$u' = \sec x \tan x$

$\int (\sec^2 x - 1)\tan x \sec x\,dx$
$= \int (u^2 - 1)\,du$
$= \frac{u^3}{3} - u$

$= \frac{\sec^3 x}{3} - \sec x$

11:
$= \int \frac{\sqrt{9-x^2}}{x^2}\, dx$
$= \int \frac{\sqrt{9\cos^2 y}}{x^2}\, dx$
$= \int \frac{3\cos y}{9\cos^2 y} 3\cos y\, dy$
$= \int \frac{\cos^2 y}{\sin^2 y}\, dy$
$= \int \cot^2 y\, dy$
$= -\cot y - y + C$
$y = \sin^- 1\frac{x}{3}$
$= -\frac{\sqrt{9-x^2}}{x} - \sin^- 1\frac{x}{3} + C$

21:
$\int \frac{5x+1}{(2x+1)(x-1)}\, dx$
$\frac{5x+1}{(2x+1)(x-1)} = \frac{A}{2x+1} + \frac{B}{x-1}$
$5x + 1 = A(x-1) + B(2x+1)$
$6 = 3B$
$B = 2$
$\frac{1}{2} = -\frac{3A}{2}$
$A = -\frac{1}{3}$
$\int \frac{-\frac{1}{3}}{2x+1}\, dx + \int \frac{2}{x-1}\, dx$
$= -\frac{\ln 2x+1}{6} + 2\ln x - 1$