58. $\int \left(e^{3.1}\right)^2 dx = \int e^{6.2} dx = e^{6.2}x + C$, because $e^{6.2}$ is a constant.

59. $\int \frac{7+14x}{(4-x-x^2)^5}dx$
$= -7\int (4-x-x^2)^{-5}[(-1-2x)dx]$
$= -7\frac{(4-x-x^2)^{-4}}{-4} + C$
$= \frac{7}{4}(4-x-x^2)^{-4} + C$

60. $\int \left(e^x - e^{-x}\right)^2 dx = \int \left(e^{2x} - 2 + e^{-2x}\right) dx$
$= \frac{1}{2}\int e^{2x}[2\,dx] - \int 2\,dx + \left(-\frac{1}{2}\right)\int e^{-2x}[-2\,dx]$
$= \frac{1}{2}e^{2x} - 2x - \frac{1}{2}e^{-2x} + C$
$= \frac{1}{2}\left(e^{2x} - e^{-2x}\right) - 2x + C$

61. $u = 4x^3 + 3x^2 - 4$
$du = \left(12x^2 + 6x\right)dx = 6x(2x+1)dx$
$\int x(2x+1)e^{4x^3+3x^2-4}dx$
$= \frac{1}{6}\int e^{4x^3+3x^2-4}[6x(2x+1)dx]$
$= \frac{1}{6}\int e^u du = \frac{1}{6}e^u + C = \frac{1}{6}e^{4x^3+3x^2-4} + C$

62. $\int (u^3 - ue^{6-3u^2})du = \frac{u^4}{4} + \frac{1}{6}\int e^{6-3u^2}[-6u\,du]$
$= \frac{1}{4}u^4 + \frac{1}{6}e^{6-3u^2} + C$

63. $\int x\sqrt{\left(8-5x^2\right)^3}\,dx = -\frac{1}{10}\int \left(8-5x^2\right)^{\frac{3}{2}}[-10x\,dx]$
$= -\frac{1}{10}\cdot\frac{\left(8-5x^2\right)^{\frac{5}{2}}}{\frac{5}{2}} + C = -\frac{1}{25}\left(8-5x^2\right)^{\frac{5}{2}} + C$

64. $\int e^{-\frac{x}{7}}dx = -7\int e^{-\frac{x}{7}}\left[-\frac{1}{7}dx\right] = -7e^{-\frac{x}{7}} + C$

65. $\int \left(\sqrt{2x} - \frac{1}{\sqrt{2x}}\right)dx = \int \sqrt{2x}\,dx - \int \frac{1}{\sqrt{2x}}dx$
$= \frac{1}{2}\int (2x)^{\frac{1}{2}}[2\,dx] - \frac{1}{2}\int (2x)^{-\frac{1}{2}}[2\,dx]$
$= \frac{1}{2}\cdot\frac{(2x)^{\frac{3}{2}}}{\frac{3}{2}} - \frac{1}{2}\cdot\frac{(2x)^{\frac{1}{2}}}{\frac{1}{2}} + C = \frac{(2x)^{\frac{3}{2}}}{3} - \sqrt{2x} + C$
$= \frac{2\sqrt{2}}{3}x^{\frac{3}{2}} - \sqrt{2}x^{\frac{1}{2}} + C$

66. $\int 3\frac{x^4}{e^{x^5}}dx = 3\int x^4 e^{-x^5}dx = -\frac{3}{5}\int e^{-x^5}[-5x^4\,dx]$
$= -\frac{3}{5}e^{-x^5} + C$

67. $\int \left(x^2+1\right)^2 dx = \int \left(x^4 + 2x^2 + 1\right)dx$
$= \frac{x^5}{5} + \frac{2x^3}{3} + x + C$

68. $\int \left[x\left(x^2-16\right)^2 - \frac{1}{2x+5}\right]dx$
$= \frac{1}{2}\int \left(x^2-16\right)^2[2x\,dx] - \frac{1}{2}\int \frac{1}{2x+5}[2\,dx]$
$= \frac{1}{2}\cdot\frac{\left(x^2-16\right)^3}{3} - \frac{1}{2}\ln|2x+5| + C$
$= \frac{1}{6}\left(x^2-16\right)^3 - \frac{1}{2}\ln|2x+5| + C$

69. $\int \left[\frac{x}{x^2+1} + \frac{x^5}{(x^6+1)^2}\right]dx$
$= \int \frac{x}{x^2+1}dx + \int \frac{x^5}{\left(x^6+1\right)^2}dx$
$= \frac{1}{2}\int \frac{1}{x^2+1}[2x\,dx] + \frac{1}{6}\int \left(x^6+1\right)^{-2}\left[6x^5dx\right]$
$= \frac{1}{2}\ln\left(x^2+1\right) + \frac{1}{6}\cdot\frac{\left(x^6+1\right)^{-1}}{-1} + C$
$= \frac{1}{2}\ln\left(x^2+1\right) - \frac{1}{6\left(x^6+1\right)} + C$

70. $\int \left[\frac{3}{x-1} + \frac{1}{(x-1)^2}\right]dx = \int \frac{3}{x-1}[dx] + \int (x-1)^{-2}[dx]$
$= 3\ln|x-1| + \frac{(x-1)^{-1}}{-1} + C = 3\ln|x-1| - \frac{1}{x-1} + C$

71. $\int \left[\frac{2}{4x+1} - (4x^2 - 8x^5)(x^3 - x^6)^{-8}\right]dx$
$= \frac{1}{2}\int \frac{1}{4x+1}[4\,dx] - \frac{4}{3}\int (x^3 - x^6)^{-8}[(3x^2 - 6x^5)dx]$
$= \frac{1}{2}\ln|4x+1| - \frac{4}{3}\cdot\frac{(x^3-x^6)^{-7}}{-7} + C$
$= \frac{1}{2}\ln|4x+1| + \frac{4}{21}(x^3 - x^6)^{-7} + C$

72. $\int \left(r^3+5\right)^2 dr = \int \left(r^6 + 10r^3 + 25\right)dr = \frac{1}{7}r^7 + \frac{5}{2}r^4 + 25r + C$

73. $\int \left[\sqrt{3x+1} - \frac{x}{x^2+3}\right]dx = \int (3x+1)^{\frac{1}{2}}dx - \int \frac{x}{x^2+3}dx = \frac{1}{3}\int (3x+1)^{\frac{1}{2}}[3\,dx] - \frac{1}{2}\int \frac{1}{x^2+3}[2x\,dx]$
$= \frac{1}{3}\cdot\frac{(3x+1)^{\frac{3}{2}}}{\frac{3}{2}} - \frac{1}{2}\ln\left(x^2+3\right) + C = \frac{2}{9}(3x+1)^{\frac{3}{2}} - \ln\sqrt{x^2+3} + C$

74. $\int \left[\frac{x}{3x^2+5} - \frac{x^2}{(x^3+1)^3}\right]dx = \frac{1}{6}\int \frac{1}{3x^2+5}[6x\,dx] - \frac{1}{3}\int (x^3+1)^{-3}[3x^2\,dx]$
$= \frac{1}{6}\ln\left|3x^2+5\right| - \frac{1}{3}\cdot\frac{(x^3+1)^{-2}}{-2} + C = \frac{1}{6}\ln\left|3x^2+5\right| + \frac{1}{6}(x^3+1)^{-2} + C$

75. Let $u = \sqrt{x} \Rightarrow du = \frac{1}{2}x^{-\frac{1}{2}}dx = \frac{1}{2\sqrt{x}}dx$.
$\int \frac{e^{\sqrt{x}}}{\sqrt{x}}dx = 2\int e^{\sqrt{x}}\left[\frac{1}{2\sqrt{x}}dx\right]$
$= 2\int e^u du = 2e^u + C = 2e^{\sqrt{x}} + C$

76. $\int \left(e^5 - 3^e\right)dx = \left(e^5 - 3^e\right)x + C$, because $e^5 - 3^e$ is a constant.

77. $\int \frac{1+e^{2x}}{4e^x}dx = \frac{1}{4}\int \left(\frac{1}{e^x} + \frac{e^{2x}}{e^x}\right)dx$
$= \frac{1}{4}\int \left(e^{-x} + e^x\right)dx$
$= -\frac{1}{4}\int e^{-x}[-1\,dx] + \frac{1}{4}\int e^x dx$
$= -\frac{1}{4}e^{-x} + \frac{1}{4}e^x + C$