Aufgabe 1:

a)
$$\int_{1}^{3} x^{4} dx = \left[\frac{x^{5}}{5}\right]_{1}^{3} = \left(\frac{243}{5}\right) - \left(\frac{1}{5}\right) = 48.4$$

a)
$$\int_{1}^{3} x^{4} dx =$$
 b) $\int_{-3}^{4} x^{6} dx =$ c) $\int_{-3}^{1} x^{3} dx =$ $\left[\frac{x^{5}}{5}\right]_{1}^{3} = \left(\frac{243}{5}\right) - \left(\frac{1}{5}\right) = 48.4$ $\left[\frac{x^{7}}{7}\right]_{-3}^{4} = \left(\frac{16384}{7}\right) - \left(-\frac{2187}{7}\right) =$ $\left[\frac{x^{4}}{4}\right]_{-3}^{1} = \left(\frac{1}{4}\right) - \left(\frac{81}{4}\right) = -20$ 2653

c)
$$\int_{-3}^{1} x^3 dx = \left[\frac{x^4}{4}\right]_{-3}^{1} = \left(\frac{1}{4}\right) - \left(\frac{81}{4}\right) = -20$$

Aufgabe 2:

a)
$$\int_{-1}^{2} -x^{6} dx = \left[-\frac{x^{7}}{7} \right]_{-1}^{2} = \left(-\frac{128}{7} \right) - \left(\frac{1}{7} \right) = -18.429$$

b)
$$\int_{-2}^{1} x \, dx =$$

$$\left[\frac{x^2}{2}\right]_{-2}^{1} = \left(\frac{1}{2}\right) - (2) = -1.5$$

a)
$$\int_{-1}^{2} -x^{6} dx =$$

$$[-\frac{x^{7}}{7}]_{-1}^{2} = (-\frac{128}{7}) - (\frac{1}{7}) =$$

$$-18.429$$
b)
$$\int_{-2}^{1} x dx =$$

$$[\frac{x^{2}}{2}]_{-2}^{1} = (\frac{1}{2}) - (2) = -1.5$$
c)
$$\int_{-2}^{4} -2x^{2} dx =$$

$$[-\frac{2x^{3}}{3}]_{-2}^{4} = (-\frac{128}{3}) - (\frac{16}{3}) = -48$$

Aufgabe 3:

a)
$$\int_{-4}^{4} -3x \, dx =$$

$$\left[-\frac{3x^2}{2} \right]_{-4}^{4} = (-24) - (-24) = 0$$

$$\int_{-4}^{4} -3x \, dx = b \int_{-4}^{-2} x^6 + 2x^3 \, dx = c \int_{0}^{3} 5x^6 - 4x^5 \, dx = \left[-\frac{3x^2}{2} \right]_{-4}^{4} = (-24) - (-24) = 0 \qquad \begin{bmatrix} \frac{x^7}{7} + \frac{x^4}{2} \right]_{-4}^{-2} = \\ (-\frac{72}{7}) - (-\frac{15488}{7}) = 2202.3 \qquad \begin{bmatrix} \frac{5x^7}{7} - \frac{2x^6}{3} \right]_{0}^{3} = (\frac{7533}{7}) - (0) = 1076.1$$

c)
$$\int_0^3 5x^6 - 4x^5 dx = \left[\frac{5x^7}{7} - \frac{2x^6}{3}\right]_0^3 = \left(\frac{7533}{7}\right) - (0) = 1076.1$$

Aufgabe 4:

a)
$$\int_{-4}^{-4} 5x^5 + x^4 + x^2 dx = \left[\frac{5x^6}{6} + \frac{x^5}{5} + \frac{x^3}{3}\right]_{-4}^{-4} = \left(\frac{15936}{5}\right) - \left(\frac{15936}{5}\right) = 0$$

a)
$$\int_{-4}^{-4} 5x^5 + x^4 + x^2 dx =$$
 b)
$$\int_{2}^{4} -3x^5 - x^4 - 4x^3 dx =$$
 c)
$$\int_{0}^{3} 4x^6 + x^4 dx =$$

$$\left[\frac{5x^6}{6} + \frac{x^5}{5} + \frac{x^3}{3} \right]_{-4}^{-4} =$$

$$\left[-\frac{x^6}{2} - \frac{x^5}{5} - x^4 \right]_{2}^{4} =$$

$$\left[\frac{4x^7}{7} + \frac{x^5}{5} \right]_{0}^{3} = \left(\frac{45441}{35} \right) - (0) =$$

$$\left(-\frac{12544}{5} \right) - \left(-\frac{272}{5} \right) = -2454.4$$
 1298.3

c)
$$\int_0^3 4x^6 + x^4 dx = \left[\frac{4x^7}{7} + \frac{x^5}{5}\right]_0^3 = \left(\frac{45441}{35}\right) - (0) = 1298.3$$

Aufgabe 5:

a)
$$\int_{-3}^{1} \frac{1}{x^2} dx = [-\frac{1}{x}]_{-3}^{1} = (-1) - (\frac{1}{3}) = -1.3333$$

b)
$$\int_{-1}^{0} x \, dx = \left[\frac{x^2}{2}\right]_{-1}^{0} = (0) - \left(\frac{1}{2}\right) = -0.5$$

a)
$$\int_{-3}^{1} \frac{1}{x^2} dx =$$
 b) $\int_{-1}^{0} x dx =$ c) $\int_{-3}^{-2} x^4 dx =$ $\left[\frac{x^2}{2}\right]_{-1}^{0} = (0) - \left(\frac{1}{2}\right) = -0.5$ $\left[\frac{x^5}{5}\right]_{-3}^{-2} = \left(-\frac{32}{5}\right) - \left(-\frac{243}{5}\right) = 42.2$

Aufgabe 6:

a)
$$\int_{-3}^{2} 2x^{5} - 3x + \frac{1}{x^{4}} dx =$$

$$[\frac{x^{6}}{3} - \frac{3x^{2}}{2} - \frac{1}{3x^{3}}]_{-3}^{2} =$$

$$(\frac{367}{24}) - (\frac{37181}{162}) = -214.22$$
b)
$$\int_{-1}^{-1} - \frac{3}{x^{5}} dx =$$

$$[\frac{3}{4x^{4}}]_{-1}^{-1} = (\frac{3}{4}) - (\frac{3}{4}) = 0$$
c)
$$\int_{0}^{1} 5x^{2} dx =$$

$$[\frac{5x^{3}}{3}]_{0}^{1} = (\frac{5}{3}) - (0) = 1.6667$$

b)
$$\int_{-1}^{-1} -\frac{3}{x^5} dx = \left[\frac{3}{4x^4}\right]_{-1}^{-1} = \left(\frac{3}{4}\right) - \left(\frac{3}{4}\right) = 0$$

c)
$$\int_0^1 5x^2 dx = [\frac{5x^3}{3}]_0^1 = (\frac{5}{3}) - (0) = 1.6667$$