1

$$\int_{-2}^{2} x^2\,dx = \frac{x^3}{3}\Big|_{-2}^{2} = \frac{(2)^3}{3} - \frac{(-2)^3}{3}$$

$$= \frac{8}{3} - \frac{-8}{3} = \frac{8}{3} + \frac{8}{3} = \frac{16}{3}$$

2

$$\int_{-3}^{3} 2\frac{x^3}{3} + 3x\Big|_{-3}^{3}$$

$$x^3 + 3x\Big|_{-3}^{3} = \left[(3)^3 + 3(3)\right] - \left[(-3)^3 + 3(-3)\right]$$

$$= \left[27 + 9\right] - \left[-27 + (-9)\right]$$

$$\left[36\right] - \left[-36\right]$$

$$36 + 36 = 72$$

3

$$\int_{-3}^{3} \frac{x^5}{5}\left(\frac{x^4}{4} - \frac{x^2}{2}\right)\Big|_{-3}^{3}$$

$$x^5\left(x^4 - x^2\right)\Big|_{-3}^{3} \quad \left[(3)^5\left((3)^4 - (3)^2\right)\right] - \left[(-3)^5\left((-3)^4 - (-3)^2\right)\right]$$

$$\left[243(81 - 9)\right] - \left[-243(-81 + 9)\right]$$

$$\left[243(72)\right] - \left[-243(-72)\right]$$

$$17496 - 17496$$

$$= 0$$

4

5 $\int_8^{12} 6(x)\,dx$

$\int_8^{12} (x+8)\,dx$

$\frac{x^2}{2} + 8x \Big|_8^{12}$

$\left(\frac{12^2}{2} + 8(12)\right) - \left(\frac{8^2}{2} + 8(8)\right)$

$168 - 96$

$\int_8^{12} 6(x)\,dx = 72$

6 $\int_{-2}^{6} -\frac{x^2}{4} + x + 3\,dx$

$= \int_{-2}^{6} \left[9 - \left(\frac{x}{2}\right)^2 - (6-x)\right] dx = \int_{-2}^{6} \left[3 - \frac{x^2}{4} + x\right] dx$

$= \left[3x - \frac{x^3}{12} + \frac{x^2}{2}\right]\Big|_{-2}^{6} = \frac{64}{3}$