Definite Integrals

$$Given: \int_{-1}^{3} x^3 dx = 10\ , \int_{-1}^{3} 3x dx = -2, \int_{-1}^{3} 5 dx = 3$$

$$\int_{-1}^{3} (x^3 - 5) dx = \int_{-1}^{3} x^3 dx - \int_{-1}^{3} 5 dx$$

$$10 - 3 = \boxed{7}$$

$$\int_{-1}^{3} (2x^3 + 6x - 5) dx = 2\int_{-1}^{3} x^3 dx + 2\int_{-1}^{3} 3x dx - \int_{-1}^{3} 5 dx$$

$$2(10) + 2(-2) - 3$$

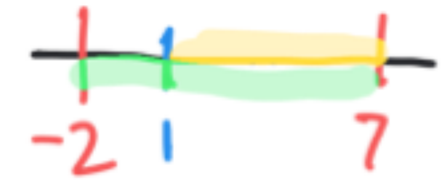
$$20 - 4 - 3 = \boxed{13}$$

$$\int_{-1}^{3} (-x^3 + 3x + 20) dx = -1\int_{-1}^{3} x^3 dx + \int_{-1}^{3} 3x dx + 4\int_{-1}^{3} 5 dx$$

$$-1(10) + (-2) + 4(3)$$

$$-10 - 2 + 12 = \boxed{0}$$

Given: $\int_{-2}^{7} f(x)\,dx = 15$ and $\int_{1}^{7} f(x)\,dx = -8$



$$\int_{-2}^{1} f(x)\,dx = 15 - (-8) = \boxed{23}$$

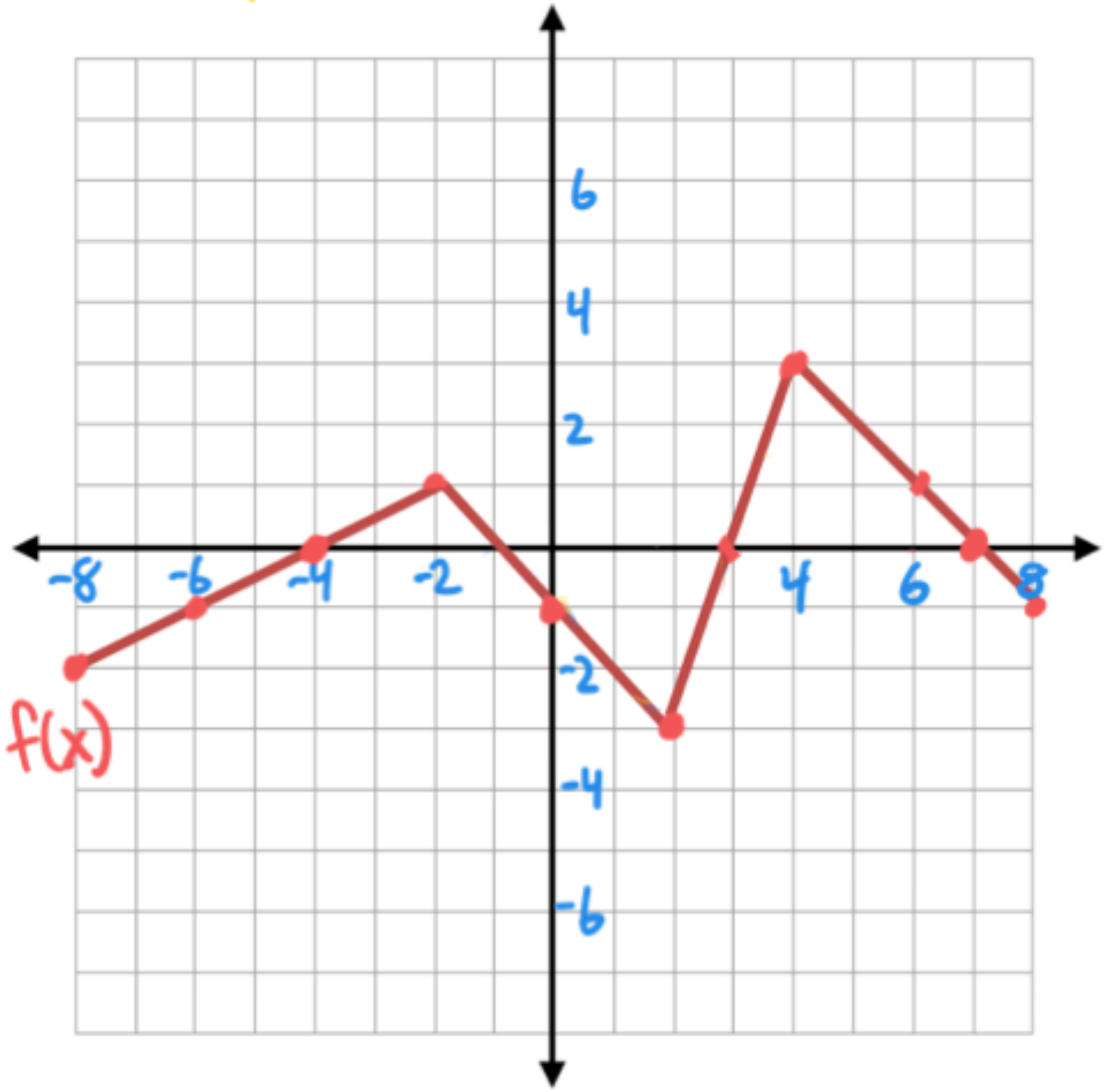
$$\int_{7}^{1} f(x)\,dx = -\int_{1}^{7} f(x)\,dx = -(-8) = \boxed{8}$$

$$\int_{3}^{3} f(x)\,dx = \boxed{0}$$

$$\int_{1}^{7} -2f(x)\,dx = -2\int_{1}^{7} f(x)\,dx = -2(-8) = \boxed{16}$$

$$\int_{7}^{-2} 3f(x)\,dx - 5 = -3\int_{-2}^{7} f(x)\,dx - 5$$

$$-3(15) - 5 = -45 - 5 = -50$$



$$\int_2^4 f(x)dx = -\left(\frac{3\cdot1}{2}\right)+\left(\frac{3\cdot1}{2}\right)=\boxed{0}$$

$$\int_{-2}^1 f(x)dx = \frac{(1\cdot1)}{2} + -\frac{(2\cdot2)}{2} = \frac{1}{2}-2$$

$$\boxed{-1\tfrac{1}{2}}$$

$$\int_{-4}^4 f(x)dx = \frac{(3\cdot1)}{2} + -\frac{(4\cdot3)}{2} + \frac{(1\cdot3)}{2}$$

$$\frac{3}{2}-\frac{12}{2}+\frac{3}{2} = -\frac{6}{2} = \boxed{-3}$$

$$\int_6^0 f(x)dx = -\int_0^6 f(x)dx$$

$$-\left[-\left(2+\frac{(2\cdot2)}{2}+\frac{(3\cdot1)}{2}\right)+\left(2+\frac{2\cdot2}{2}+\frac{3\cdot1}{2}\right)\right]=\boxed{0}$$

$$\int_0^3 -3f(x)dx - 4 = -3(-5.5)-4 = \boxed{12.5}$$

$$-3\int_0^3 f(x)dx - 4 = -3\left(-\left(2+\frac{2\cdot2}{2}+\frac{3\cdot1}{2}\right)\right)-4$$

$$\int_5^{-1} 2f(x)dx = -2\int_{-1}^5 f(x)dx = -2(-2) = \boxed{4}$$

$$-2\left[-\left(\frac{4\cdot3}{2}\right)+\left(\frac{1\cdot3}{2}+\frac{1\cdot1}{2}+2\right)\right] = -2\left[-6+4\right]$$