Answer key

The method: Definite integrals

Find an antiderivative F, then work out F(top) − F(bottom).

$$\int_{-1}^{2} (x^2 - x - 4)\,dx = -\frac{21}{2}$$

$F(x) = \frac{x^3}{3} - \frac{x^2}{2} - 4x$ an antiderivative; no C is needed

$(-\frac{22}{3}) - (\frac{19}{6}) = -\frac{21}{2}$ F(2) − F(−1)

$$\int_{-1}^{3} (-4x + 6)\,dx = 8$$

$F(x) = -2x^2 + 6x$ an antiderivative; no C is needed

$(0) - (-8) = 8$ F(3) − F(−1)

$$\int_{-2}^{0} (-3x^3 + 4x^2 + 2x + 5)\,dx = \frac{86}{3}$$

$F(x) = -\frac{3x^4}{4} + \frac{4x^3}{3} + x^2 + 5x$ an antiderivative; no C is needed

$(0) - (-\frac{86}{3}) = \frac{86}{3}$ F(0) − F(−2)

Problems 1 and 2 worked out · Version 0A

$$\int_{1}^{4} (3x^3 - 4x^2 - x - 1)\,dx = \frac{387}{4}$$

$F(x) = \frac{3x^4}{4} - \frac{4x^3}{3} - \frac{x^2}{2} - x$ an antiderivative; no C is needed

$(\frac{284}{3}) - (-\frac{25}{12}) = \frac{387}{4}$ F(4) − F(1)

$$\int_{-2}^{0} (-4x^3 - 5x^2 - 5x + 5)\,dx = \frac{68}{3}$$

$F(x) = -x^4 - \frac{5x^3}{3} - \frac{5x^2}{2} + 5x$ an antiderivative; no C is needed

$(0) - (-\frac{68}{3}) = \frac{68}{3}$ F(0) − F(−2)

Definite integrals · Version 0A

1) $\frac{387}{4}$ 2) $\frac{68}{3}$ 3) 10 4) $-\frac{40}{3}$ 5) $\frac{10}{3}$ 6) 177 7) 2

8) $-\frac{177}{2}$ 9) $\frac{45}{2}$ 10) $\frac{63}{4}$ 11) −28 12) −12

13) $\frac{605}{12}$ 14) $-\frac{7}{3}$ 15) $\frac{251}{4}$