Answer key

The method: Average rate of change

The average rate of change from x = a to x = b is (f(b) − f(a)) ÷ (b − a).

$f(x) = -2x^2 - x - 4$; from −2 to 4 → −5

$f(4) = -2(4)^2 - (4) - 4 = -40$

$f(-2) = -2(-2)^2 - (-2) - 4 = -10$

$\frac{-40 - (-10)}{4 - (-2)} = \frac{-30}{6} = -5$ the change in f over the change in x

$f(x) = -2x^3 + 4x + 6$; from 2 to 4 → −52

$f(4) = -2(4)^3 + 4(4) + 6 = -106$

$f(2) = -2(2)^3 + 4(2) + 6 = -2$

$\frac{-106 - (-2)}{4 - 2} = \frac{-104}{2} = -52$ the change in f over the change in x

Problems 1 and 2 worked out · Version 0A

$f(x) = -3x^2 + 6$; from 1 to 2 → −9

$f(2) = -3(2)^2 + 6 = -6$

$f(1) = -3(1)^2 + 6 = 3$

$\frac{-6 - 3}{2 - 1} = \frac{-9}{1} = -9$ the change in f over the change in x

$f(x) = -3x^2 + x + 1$; from 3 to 5 → −23

$f(5) = -3(5)^2 + (5) + 1 = -69$

$f(3) = -3(3)^2 + (3) + 1 = -23$

$\frac{-69 - (-23)}{5 - 3} = \frac{-46}{2} = -23$ the change in f over the change in x

Average rate of change · Version 0A

1) −9 2) −23 3) 39 4) 3 5) 68 6) 6 7) −19
8) 2 9) 6 10) 22 11) 0 12) −6 13) −1 14) 10