

Part 2

$$\begin{aligned} 1) \int_3^6 \frac{dx}{x} &= \ln x \Big|_3^6 \\ &= \ln 6 - \ln 3 \\ &= \ln\left(\frac{6}{3}\right) = \boxed{\ln 2} \end{aligned}$$

$$\begin{aligned} 3) \int_{-2}^{-1} -4 dx &= -4x \Big|_{-2}^{-1} \\ &= 4 - 8 = \boxed{-4} \end{aligned}$$

Part 1

$$\begin{aligned} 5) \text{ Find } \frac{d}{dx} \int_2^{x^2} -4t^3 + 3 dt \\ &= [-4(x^2)^3 + 3] \cdot 2x \\ &= (-4x^6 + 3)2x \\ &= \boxed{-8x^7 + 6x} \end{aligned}$$

$$\begin{aligned} 7) \text{ Find } \frac{d}{dx} \int_3^x -5t^3 - 2t^2 - 4t - 4 dt \\ &= \boxed{-5x^3 - 2x^2 - 4x - 4} \end{aligned}$$

Solve:

$$\begin{aligned} 2) \int_0^2 x^2 - 5x + 4 dx &= \\ &= \left[\frac{x^3}{3} - \frac{5}{2}x^2 + 4x \right]_0^2 \\ &= \frac{2}{3} - 0 = \boxed{\frac{2}{3}} \end{aligned}$$

$$\begin{aligned} 4) \int_0^2 -3x^2 - 2x - 2 dx &= \\ &= \left[-x^3 - x^2 - 2x \right]_0^2 \\ &= -16 - 0 = \boxed{-16} \end{aligned}$$

$$\begin{aligned} 6) \text{ Find } \frac{d}{dx} \int_1^x \tan(t) dt \\ &= \boxed{\tan x} \end{aligned}$$

$$\begin{aligned} 8) \text{ Find } \frac{d}{dx} \int_0^{2x} 3t + 1 dt \\ &= [3(2x) + 1] \cdot 2 \\ &= 2(6x + 1) = \boxed{12x + 2} \end{aligned}$$

9)

$$A(x) = \int_{-3}^x -2t + 2 \, dt$$

Find $A'(-2)$ $A' = -2x + 2$
 $A'(-2) = \boxed{6}$

10)

$$\text{Find } \frac{d}{dx} \int_1^x \sec(t) \, dt$$

$$= \boxed{\sec x}$$

11)

$$A(x) = \int_{-3}^x -3t^2 - 3t + 1 \, dt$$

Find $A'(2)$

$$A' = -3x^2 - 3x + 1$$

$$A'(2) = \boxed{-17}$$

12)

$$A(x) = \int_0^{x^2} t + 1 \, dt$$

Find $A'(2)$ $A' = (x^2 + 1)2x$
 $= 2x^3 + 2x$

$$A'(2) = \boxed{20}$$