Part 2

Solve:

1) $\int_3^6 \frac{dx}{x} = \ln x \Big|_3^6$

$= \ln 6 - \ln 3$

$= \ln\left(\frac{6}{3}\right) = \boxed{\ln 2}$

2) $\int_0^2 x^2 - 5x + 4\,dx =$

$\frac{x^3}{3} - \frac{5}{2}x^2 + 4x \Big|_0^2$

$= \frac{2}{3} - 0 = \boxed{\frac{2}{3}}$

3) $\int_{-2}^{-1} -4\,dx = -4x \Big|_{-2}^{-1}$

$= 4 - 8 = \boxed{-4}$

4) $\int_0^2 -3x^2 - 2x - 2\,dx =$

$-x^3 - x^2 - 2x \Big|_0^2$

$= -16 - 0 = \boxed{-16}$

Part 1

5) Find $\frac{d}{dx}\int_2^{x^2} -4t^3 + 3\,dt$

$= \left[-4(x^2)^3 + 3\right] \cdot 2x$

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

$= \boxed{-8x^7 + 6x}$

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

$= \boxed{\tan x}$

7) Find $\frac{d}{dx}\int_3^x -5t^3 - 2t^2 - 4t - 4\,dt$

$= \boxed{-5x^3 - 2x^2 - 4x - 4}$

8) Find $\frac{d}{dx}\int_0^{2x} 3t + 1\,dt$

$= \left[3(2x) + 1\right] \cdot 2$

$= 2(6x + 1) = \boxed{12x + 2}$

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

Find A'(-2) $A' = -2x + 2$

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

10) 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) $A(x) = \int_{x^2}^{0} t + 1\ dt$

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

$= 2x^3 + 2x$

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