

## Integration Exercises - Part 3 (Hyperbolic Functions)

(2 pages; 6/2/18)

(1)  $\int \operatorname{cosech}^2 x \, dx$

(2)  $\int \tanh x \, dx$  (from 1st principles)

(3)  $\int \operatorname{sech} x \tanh x \, dx$

(4)  $\int \tanh^2 x \, dx$

(5)  $\int \operatorname{sech}^2 x \tanh^2 x \, dx$

(6)  $\int \operatorname{sech}^3 x \tanh x \, dx$

(7)  $\int \cosh^2 x \, dx$

(8)  $\int \cosh^3 x \, dx$

(9)  $\int \operatorname{sech} x \, dx$

(10)  $\int \frac{1}{\sqrt{4x^2-9}} \, dx$

(11) (a)  $\int \cosh^{-1} x \, dx$  (b)  $\int \sinh^{-1} x \, dx$  (c)  $\int \tanh^{-1} x \, dx$

(12)  $\int \frac{1}{(x^2-9)^{\frac{3}{2}}} \, dx$

(13)  $\int \sqrt{4+x^2} \, dx$

(14)  $\int \sqrt{\frac{x}{1+x}} \, dx$

(15)  $\int \sqrt{4x^2-1} \, dx$

(16)  $\int x^2 \sqrt{1+x^2} \, dx$

(17)  $\int \frac{1}{\sqrt{x(x+1)}} \, dx$

(18)  $\int \frac{x^2}{\sqrt{x^6-1}} \, dx$

(19)  $\int_0^4 \frac{4x+1}{\sqrt{x^2+9}} \, dx$

$$(20) \int_0^1 \sqrt{16x^2 + 9} \, dx$$

$$(21) \int \sqrt{\frac{x+1}{x}} \, dx$$

$$(22) \int \frac{1}{(2x^2+3)^{\frac{3}{2}}} \, dx$$

$$(23) \int \operatorname{cosech}(3x)\operatorname{coth}(3x) \, dx$$