**6C Hyperbolic Equations and Identities**

1. Prove that:

$$cosh^{2}A-sinh^{2}A≡1$$

$$\sinh(\left(A+B\right))≡\sinh(A)\cosh(B)+\cosh(A)\sinh(B)$$

$$\cosh(2A≡1+2sinh^{2}A)$$

Osborn’s Rule:

1. Write down the hyperbolic identity corresponding to:

$$cos2A≡2cos^{2}A-1$$

$$tan⁡(A-B)≡\frac{tanA-tanB}{1+tanAtanB}$$

1. Given that $\sinh(x)=\frac{3}{4}$, find the exact value of:
2. $\cosh(x)$
3. $\tanh(x)$
4. $\sinh(2x)$
5. Solve the equation below for real values of $x$.

$$6\sinh(x)-2\cosh(x)=7$$

1. Solve the equation below, giving answers as natural logarithms.

$$2cosh^{2}x-5\sinh(x)=5$$

1. Solve the equation below, giving answers as natural logarithms where appropriate.

$$\cosh(2x)-5\cosh(x)+4=0$$

Some additions to Osborn’s rule