

Find the following

1.  $\sin(\arccos(\frac{x}{a}))$

5.  $\sec(\arctan(\frac{x}{a}))$

2.  $\sin(\arctan(\frac{x}{a}))$

6.  $\cos(\arctan(\frac{x}{a}))$

3.  $\tan(\arcsin(\frac{x}{a}))$

7.  $\cos(2 \arcsin(\frac{x}{a}))$

4.  $\sec(\arcsin(\frac{x}{a}))$

8.  $\sin(2 \arccos(\frac{x}{a}))$

Find the integral  $\int \frac{e^{2x}}{\sqrt{e^x + 1}} dx$  using the following steps:

1. Put  $u = \sqrt{e^x + 1}$  and find  $x$  in terms of  $u$

2. Find  $dx$  in terms of  $u$

3. (easy one) find  $e^x$  in terms of  $u$  and then square it to get  $e^{2x}$

4. Write the integral in terms of  $u$  and  $du$  and solve a very simple integral

5. Substitute back

6. Repeat the above process to find  $\int e^{\sqrt{x}} dx$  this time with  $u = \sqrt{x}$