

Find the following

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

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

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

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

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

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

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

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

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 $u = \sqrt{x}$