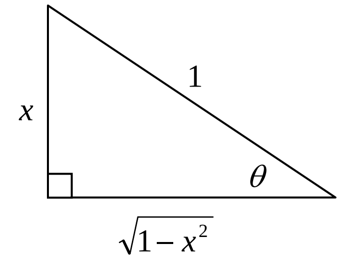
11. $H(x)=\sqrt[3]{1-e^{2x}}$, so $y=\sqrt[3]{1-e^{2x}}$. Then, the inverse is $x=\sqrt[3]{1-e^{2y}}$, and we need to solve for *y*.

$$x=\sqrt[3]{1-e^{2y}} \Rightarrow x^3=1-e^{2y} \Rightarrow e^{2y}=1-x^3 \Rightarrow \ln\left(e^{2y}\right)=\ln\left(1-x^3\right) \Rightarrow 2y=\ln\left(1-x^3\right) \Rightarrow y=\frac{1}{2}\ln\left(1-x^3\right).$$

12. $\sec\left(\sin^{-1}x\right)$ is really $\sec\theta$, where $\theta=\sin^{-1}x$. This means $x=\sin\theta$, so we set up a generic diagram like the one to the right. Then, we use the Pythagorean Theorem: $b^2+x^2=1^2 \Rightarrow b=\sqrt{1-x^2}$. So the answer is $\sec\theta=\frac{1}{\cos\theta}=\frac{\text{hyp}}{\text{adj}}=\frac{1}{\sqrt{1-x^2}}$.



13. For $f(x)=\frac{x+2}{x^2-4}$, the discontinuities are places where the denominator is zero, so $x^2-4=0 \Rightarrow x=\pm 2$.

When we factor the numerator and denominator, we can tell what kind: $f(x)=\frac{x+2}{x^2-4}=\frac{x+2}{(x-2)(x+2)}$.

So the *x* + 2 "problem" will cancel, and that is a removable discontinuity. The *x* – 2 "problem" will not cancel out, so that is a place where there's a vertical asymptote (an infinite discontinuity). To fix the removable discontinuity, we simply cancel the *x* + 2 factors, then plug in –2 to what remains, as follows: $f(x)=\frac{x+2}{(x-2)(x+2)}=\frac{1}{x-2}$, if *x* is not –2. So, we set $f(-2)=\frac{1}{-2-2}=-\frac{1}{4}$, and we've "repaired" the hole in the graph.