```
> restart;
> a := Pi*(1+(1/4)*sinh(u)^2)*cosh(u)^2;
```

$$a := \pi \left(1 + \frac{1}{4} \sinh(u)^2 \right) \cosh(u)^2$$

```
> a2 := subs(sinh(u) = (exp(u)-exp(-u))*(1/2), a);
```

$$a2 := \pi \left(1 + \frac{1}{4} \left(\frac{1}{2} \mathbf{e}^{u} - \frac{1}{2} \mathbf{e}^{(-u)} \right)^2 \right) \cosh(u)^2$$

```
> a3 := subs(cosh(u) = (exp(u)+exp(-u))*(1/2), a2);
```

$$a3 := \pi \left(1 + \frac{1}{4} \left(\frac{1}{2} \mathbf{e}^{u} - \frac{1}{2} \mathbf{e}^{(-u)} \right)^2 \right) \left(\frac{1}{2} \mathbf{e}^{u} + \frac{1}{2} \mathbf{e}^{(-u)} \right)^2$$

```
> a4 := expand(a3);
```

$$a4 := \frac{1}{4} \pi \left(\mathbf{e}^{u} \right)^2 + \frac{15}{32} \pi + \frac{\pi}{4 \left(\mathbf{e}^{u} \right)^2} + \frac{1}{64} \pi \left(\mathbf{e}^{u} \right)^4 + \frac{\pi}{64 \left(\mathbf{e}^{u} \right)^4}$$

```
> a5 := int(a4, u);
```

$$a5 := \frac{1}{8} \pi \left(\mathbf{e}^{u} \right)^2 + \frac{15}{32} \pi u - \frac{\pi}{8 \left(\mathbf{e}^{u} \right)^2} + \frac{1}{256} \pi \left(\mathbf{e}^{u} \right)^4 - \frac{\pi}{256 \left(\mathbf{e}^{u} \right)^4}$$

```
> g := unapply(a5, u);
```

$$g := u \rightarrow \frac{1}{8} \pi \left(\mathbf{e}^{u} \right)^2 + \frac{15}{32} \pi u - \frac{\pi}{8 \left(\mathbf{e}^{u} \right)^2} + \frac{1}{256} \pi \left(\mathbf{e}^{u} \right)^4 - \frac{\pi}{256 \left(\mathbf{e}^{u} \right)^4}$$

```
> a6 := g(log(2+sqrt(5)))-g(0);
```

$$a6 := \frac{1}{8} \pi \left(2 + \sqrt{5} \right)^2 + \frac{15}{32} \pi \ln(2 + \sqrt{5}) - \frac{\pi}{8 \left(2 + \sqrt{5} \right)^2} + \frac{1}{256} \pi \left(2 + \sqrt{5} \right)^4$$
$$- \frac{\pi}{256 \left(2 + \sqrt{5} \right)^4}$$

```
> a7 := int(2*Pi*(1+x^2)*sqrt(1+4*x^2), x = 0 .. 1);
```

$$a7 := -\frac{1}{4} \sqrt{\pi} \left(\sqrt{\pi} + (-4 \ln(2) - 1) \sqrt{\pi} - 4 \sqrt{\pi} \sqrt{5} - 2 \sqrt{\pi} \ln\left(\frac{1}{2} + \frac{1}{4} \sqrt{5} \right) \right)$$
$$- \frac{1}{16} \sqrt{\pi} \left(\frac{1}{8} \sqrt{\pi} - \frac{1}{4} \left(\frac{1}{2} - 4 \ln(2) \right) \sqrt{\pi} - 9 \sqrt{\pi} \sqrt{5} + \frac{1}{2} \sqrt{\pi} \ln\left(\frac{1}{2} + \frac{1}{4} \sqrt{5} \right) \right)$$

```
> simplify(a6-a7);
```

$$0$$

```
> evalf(a6);
```

$$13.10220174$$

```
>
```