A2T
Example 4 page 55

Remember that

$$x^{-3} = \frac{1}{x^3}$$

Definition 3 page 53.

How do we show this? Take the term $x^{-3}$ and multiply it by $\frac{x^3}{x^3}$ …. Which is the same term with the positive exponent over itself. Since this is equal to 1, we can do that.. So we get

$$x^{-3} = x^{-3}\left(\frac{x^3}{x^3}\right) = \frac{x^{-3}x^3}{x^3} = \frac{x^{(-3+3)}}{x^3} = \frac{x^0}{x^3} = \frac{1}{x^3}$$

Now Example 4 is the same thing – just a little more complex.

$$\frac{(1+x^2)^{1/2}(2x) - x^2\left(\frac{1}{2}\right)(1+x^2)^{-1/2}(2x)}{1+x^2}$$

To get the term $(1+x^2)^{-1/2}$ into the denominator (and therefore have a positive exponent) they multiply the WHOLE thing by the conjugate (opposite exponent sign) – or $\frac{(1+x^2)^{1/2}}{(1+x^2)^{1/2}}$

Which gives us

$$\frac{(1+x^2)^{1/2}(2x) - x^2\left(\frac{1}{2}\right)(1+x^2)^{-1/2}(2x)}{1+x^2} * \frac{(1+x^2)^{1/2}}{(1+x^2)^{1/2}}$$

Then in the other steps they just multiply things out.