

1)

$$= -x^{-2} - 4x^{-3} + 15x^{-4} + \frac{1}{2}x^{-\frac{1}{2}} - \frac{3}{2}x^{\frac{1}{2}} - \frac{3}{2}x^{-\frac{3}{2}}$$

2)

$$= (1+x^2)^{\frac{1}{2}} + x \cdot \frac{1}{2} (1+x^2)^{-\frac{1}{2}} \cdot 2x = (1+x^2)^{\frac{1}{2}} + x^2 (1+x^2)^{-\frac{1}{2}} =$$

$$= \frac{1+x^2+x^2}{\sqrt{1+x^2}} = \frac{2x^2+1}{\sqrt{1+x^2}}$$

3)

$$= \frac{2}{1-x^2} - \frac{2x}{(1-x^2)^2} \cdot -2x = \frac{2-2x^2+4x^2}{(1-x^2)^2} = \frac{2(1+x^2)}{(1-x^2)^2}$$

4)

$$= \frac{1}{2(x+\sqrt{x+\sqrt{x}})^{\frac{1}{2}}} \cdot \left(1 + \frac{1}{2} \cdot \frac{1+x^{\frac{1}{2}} \cdot \frac{1}{2}}{(x+\sqrt{x})^{\frac{1}{2}}}\right) = \frac{2\sqrt{x+\sqrt{x}} + 1 + \frac{1}{2}\sqrt{x}}{4(\sqrt{x+\sqrt{x}}) \cdot (x+\sqrt{x+\sqrt{x}})^{\frac{1}{2}}} =$$

$$= \frac{4\sqrt{x} \cdot \sqrt{x+\sqrt{x}} + 2\sqrt{x} + 1}{4\sqrt{x} \cdot \sqrt{x} \cdot \sqrt{x+\sqrt{x}}}$$

5)

$$= \frac{1}{x+\sqrt{x^2+1}} \cdot \left(1 + \frac{1}{2} (x^2+1)^{-\frac{1}{2}} \cdot 2x\right) = \frac{\sqrt{x^2+1} + x}{\sqrt{x^2+1} \cdot (x+\sqrt{x^2+1})} = \frac{1}{\sqrt{x^2+1}}$$

6)

$$= \ln(x+\sqrt{x^2+1}) + \frac{x}{\sqrt{x^2+1}} - \frac{1}{2} \frac{2x}{\sqrt{x^2+1}} = \ln(x+\sqrt{x^2+1})$$

7)

$$= \frac{1}{\sqrt{1-\sin^2 x}} \cdot \cos x = \frac{\cos x}{\cos x} = 1$$

8)

$$= \sin 0^\circ + \cos 0^\circ \cdot \frac{\pi}{180} \approx \frac{3.14159}{180} \approx 0.0175$$