



次の式を微分しなさい。

$$(1) y = (2x^2 - 1)\sqrt{2 - x^2}$$

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

$$(3) y = \sqrt{\frac{1+x}{1-x}}$$

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

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

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

$$y' = \frac{-x(6x^2-9)}{\sqrt{2-x^2}}$$

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

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

$$y' = 1 - \frac{x}{\sqrt{x^2 - 1}}$$

$$(3) y = \left( \frac{1+x}{1-x} \right)^{\frac{1}{2}}$$

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

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

$$y' = \frac{1}{(1-x)\sqrt{1-x^2}}$$

