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Tugas

1. Tentukan daerah definisi dan daerah hasil fungsi-fungsi berikut:

a. $g(x) = \frac{1}{2x}$

$$\begin{aligned}
 2x &\neq 0 & D &= x | x \neq 0, x \notin R \\
 x &\neq 0 & R &= y | y \neq 0, x \notin R \\
 y &= \frac{1}{2x} \\
 y(2x) &= 1 \\
 2xy &= 1 \\
 x(2y) &= 1 \\
 x &= \frac{1}{2y} \\
 2y &\neq 0 \\
 y &\neq 0
 \end{aligned}$$

b. $f(x) = \sqrt{1-x^2}$

$$\begin{aligned}
 1-x^2 &\geq 0 \\
 (1-x)(1+x) &\geq 0 \\
 1-x &\geq 0 & (-y+1)(y+1) &= x^2 \\
 x &\leq 1 & \sqrt{-y+1} & \\
 1+x &\geq 0 & -y+1 &\geq 0 \\
 x &\geq -1 & y &\leq 1\sqrt{y+1}=x \\
 y &= \sqrt{1-x^2} & y+1 &\geq 1 \\
 y^2 &= 1-x^2 & y &\geq -1 \\
 y^2-1 &= -x^2 \\
 -y^2+1 &= x^2
 \end{aligned}$$



c.

$$\begin{aligned}g(x) &= 1 - x^2 \\y &= 1 - x^2 \\y - 1 &= -x^2 \\x^2 &= -y + 1 \\x &= \sqrt{-y + 1} \\-y + 1 &\geq 0 \\y &\leq 1\end{aligned}$$

$$\begin{aligned}D &= x | x \notin R \\R &= y | y \geq 1, x \notin R\end{aligned}$$

d.

$$\begin{aligned}f(x) &= x^2 + 4 \\y &= x^2 + 4 \\y - 4 &= x^2 \\x &= \sqrt{y - 4} \\y - 4 &\geq 0 \\y &\geq 4\end{aligned}$$

$$\begin{aligned}D &= x | x < R \\R &= y | y \geq 4, y \notin R\end{aligned}$$

e.

$$\begin{aligned}g(x) &= \frac{1}{\sqrt{2+x}} \\2+x &> 0 \\x &> -2 \\y &= \frac{1}{\sqrt{2+x}} \\y^2(2+x) &= 1^2 \\2+x &= \frac{1}{y^2}\end{aligned}$$

$$\begin{aligned}D &= x | x - 2, x \notin R \\R &= y | y \neq 0, \notin R\end{aligned}$$

$$\begin{aligned}y \neq 0 \text{ artinya } y > 0 \text{ dari } y < 0 \\D(x > -2) \text{ adalah } y > 0\end{aligned}$$

$$x = \frac{1}{y^2} - \frac{2y^2}{y^2} = \frac{1-2y^2}{y^2} = y0$$



2. Buktikan kesamaan berikut.

a.

$$\begin{aligned} (1 + \sin x)(1 - \sin x) &= \frac{1}{\sec^2 x} \\ 1 - \sin(x) + \sin(x) - \sin^2 x &= \frac{1}{\left(\frac{1}{\cos} x\right)^2} \\ 1 - \sin^2 x &= \frac{1}{\frac{1}{\cos^2 x}} \\ \cos^2 x &= \frac{1}{1} x \cos^2 \frac{x}{1} \\ \cos^{2x} &= \cos^2 x \end{aligned}$$

b.

$$\begin{aligned} \sec x - \sin x \cos x &= \cos x \\ \sec x - \sin x \cos x - \cos x &= 0 \\ \frac{1}{\cos x} - \sin x \cos x - \cos x &= 0 \end{aligned}$$

$$\frac{1}{\cos} x - \sin x \cos \frac{x}{1} - \cos \frac{x}{1} = 0$$

