31. $f(x) = x^2, \quad g(x) = x + 1$

f

D: $-\infty < x < \infty$

R: $x^2 \geq 0$

g

D: $-\infty < x < \infty$

R $-\infty < x+1 < \infty$

$-\infty < x < 0$ or $0 \leq x < \infty$ | $x^2 > 0$ or $0 \leq x^2$

$f(g(x)) = (x+1)^2$

D: $-\infty < x < \infty$

$-\infty < x+1 < \infty$

R: $0 \leq (x+1)^2$

33. $f(x) = \dfrac{1}{x}, \quad g(x) = 2x + 4$

f

D: $x < 0$ or $0 < x$

$-\infty < x < 0$ $\quad 0 < x < \infty$

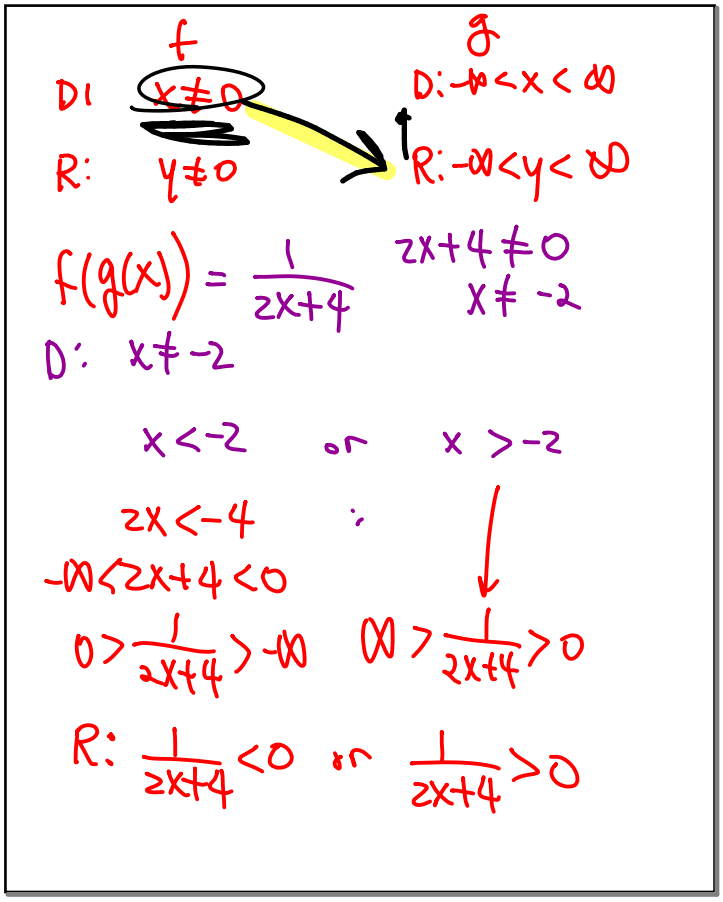
$0 > \frac{1}{x} > -\infty$ $\quad \infty > \frac{1}{x} > 0$

R: $\frac{1}{x} < 0$ or $\frac{1}{x} > 0$

g

D: $-\infty < x < \infty$

R: $-\infty < 2x+4 < \infty$



$-2 < x < 7$

$0 \leq x^2 < 49$

$f(x) = \frac{1}{x}$

f

D: $x \neq 0$

R: $y \neq 0$

f

D: $x \neq 0$

R: $y \neq 0$

$f \circ f = \frac{1}{\frac{1}{x}} = x$

D: $x \neq 0$

R: $x \neq 0$

39. $f(x) = \sqrt[3]{x}, \quad g(x) = \sqrt[4]{x}$

f

D: $-\infty < x < \infty$

R: $-\infty < \sqrt[3]{x} < \infty$

g

D: $x \geq 0$

R: $\sqrt[4]{x} \geq 0$

$f \cdot g = \sqrt[3]{\sqrt[4]{x}} = \sqrt[12]{x}$

D: $x \geq 0$

R: $\sqrt[12]{x} \geq 0$