

76)  $F(x) = \cos 2x$   $a=1$   $[0, \frac{\pi}{2}]$

Step 1: Find  $F^{-1}(a)$

$$\begin{aligned} 1 &= \cos 2x \\ \cos^{-1}(1) &= 2x \\ 0 &= 2x \\ 0 &= x \\ (0, 1) \\ F(0) &= 1 \\ F^{-1}(1) &= 0 \end{aligned}$$

Step 2:

Find  $F'(x)$

$$\begin{aligned} F(x) &= \cos 2x \\ F'(x) &= -\sin 2x \cdot 2 \\ F'(0) &= -2\sin 2(0) \\ F'(0) &= 0 \end{aligned}$$

$$(F^{-1})'(x) = \frac{1}{F'(F^{-1}(x))}$$

$$= \frac{1}{F'(0)}$$

$$= \frac{1}{0} = \emptyset$$

80)  $F(x) = \sqrt{x-4}$   $a=2$

$$(F^{-1})'(x) = \frac{1}{F'(F^{-1}(x))}$$

Step 1: Find  $F^{-1}(a)$

$$\begin{aligned} 2 &= \sqrt{x-4} \\ 4 &= x-4 \\ 8 &= x \\ (8, 2) \\ F^{-1}(2) &= 8 \end{aligned}$$

Step 2:  
Find  $F'(x)$

$$F(x) = \sqrt{x-4}$$

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

$$F'(8) = \frac{1}{2\sqrt{8-4}} = \frac{1}{4}$$

$$= \frac{1}{F'(8)}$$

$$= \frac{1}{\frac{1}{4}}$$

$$= 4$$

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

$(1, 2)$

$(2, 1)$

a)  $\mathbb{R}$

a)  $(-\infty, 0) \cup (0, 4)$

b)  $(-\infty, 0) \cup (0, 4)$

b)  $\mathbb{R}$

d)  $F'(x) = \frac{0-4(2x)}{(1+x^2)^2}$

$$= \frac{-8x}{(1+x^2)^2} \Big|_1 = \frac{-8}{4} = -2$$

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

$$\frac{1}{2\sqrt{\frac{2}{2}}} \cdot \frac{-2-2}{4} = -\frac{1}{2}$$