Sample Solutions

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1.5 #26

Find the inverse of $f(x) = e^{2x-1}$.

Solution:

1) Set $y = e^{2x-1}$

2) Solve for x:

$$y = e^{2x-1}$$

$$\ln(y) = 2x - 1$$

$$\ln(y) + 1 = 2x$$

$$x = \frac{1}{2}\ln(y) + \frac{1}{2}$$

$$= \ln(\sqrt{y}) + 1/2$$

3) $\boxed{f^{-1}(y) = \ln(\sqrt{y}) + 1/2}$

1.4 #20 a)

Find the domain of $g(t) = \sqrt{10^t - 100}$.

Solution: The only issue is $\sqrt{z}$ is only defined for $z \geq 0$. So we need:

$$10^t - 100 \geq 0,$$

$$10^t \geq 100,$$

$$\log_{10}(10^t) \geq \log_{10}(100),$$

$$t \geq 2.$$

Domain: $[2, \infty)$