

1.4 | 연습문제 정답

01. 1

02. $-\frac{\pi}{6}$

03. 0

04. $-\frac{\sqrt{3}}{2}$

05. $-\sqrt{3}$

06. 1

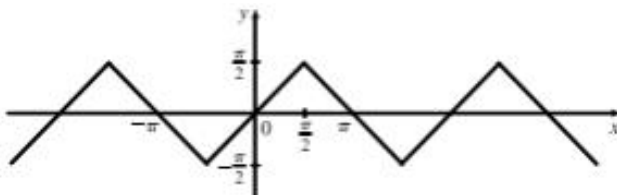
07. $\frac{63}{65}$

08. $-\frac{56}{65}$

09. -4

10. $\frac{\pi}{4}$

11.



12. $\cos^{-1}\left(\frac{1}{x}\right) = \alpha, x \neq 0, (0 \leq \alpha \leq \pi)$ 라 두면 $\cos \alpha = \frac{1}{x}$ 이고

$$x = \frac{1}{\cos \alpha} = \sec \alpha \left(\alpha \neq \frac{\pi}{2} \right) \Rightarrow \sec^{-1} x = \alpha \text{ 이므로 } \sec^{-1} x = \cos^{-1}\left(\frac{1}{x}\right) \text{ 이다.}$$

13. $\frac{1}{2x^2 - 1}$

14. $\cos^{-1} x = a (0 \leq a \leq \pi)$ 라 두면 $x = \cos a = \sin\left(\frac{\pi}{2} - a\right)$ 이고

$$-\frac{\pi}{2} \leq \frac{\pi}{2} - a \leq \frac{\pi}{2} \text{ 이다.}$$

$$\sin^{-1} x = \frac{\pi}{2} - a = \frac{\pi}{2} - \cos^{-1} x \text{ 이고 } \cos^{-1} x = \frac{\pi}{2} - \sin^{-1} x \text{ 이다.}$$

15. $\sin^{-1}\left(\frac{1}{\sqrt{10}}\right) = a \left(-\frac{\pi}{2} \leq a \leq \frac{\pi}{2}\right), \sin^{-1}\left(\frac{1}{\sqrt{5}}\right) = b \left(-\frac{\pi}{2} \leq b \leq \frac{\pi}{2}\right)$ 라 두면

$$\sin(a+b) = \frac{1}{\sqrt{10}} \cdot \frac{2}{\sqrt{5}} + \frac{3}{\sqrt{10}} \cdot \frac{1}{\sqrt{5}} = \frac{1}{\sqrt{2}} \Rightarrow a+b = \frac{\pi}{4} \text{ 이고}$$

$$\cos(a+b) = \frac{3}{\sqrt{10}} \cdot \frac{2}{\sqrt{5}} - \frac{1}{\sqrt{10}} \cdot \frac{1}{\sqrt{5}} = \frac{1}{\sqrt{2}} \Rightarrow a+b = \frac{\pi}{4} \text{ 이므로}$$

$$\sin^{-1}\left(\frac{1}{\sqrt{10}}\right) + \sin^{-1}\left(\frac{1}{\sqrt{5}}\right) = a+b = \frac{\pi}{4}$$

16. $\tanh^{-1} x = y$ 라 두면

$$\tanh y = x \Rightarrow \frac{e^y - e^{-y}}{e^y + e^{-y}} = x \Rightarrow (e^y)^2 - x((e^y)^2 + 1) - 1 = 0$$

$$\Rightarrow e^y = \sqrt{\frac{1+x}{1-x}} \text{ 이므로}$$

$$\tanh^{-1} x = y = \ln \sqrt{\frac{1+x}{1-x}} = \frac{1}{2} \ln\left(\frac{1+x}{1-x}\right), (-1 < x < 1)$$