習題

11. $y = \frac{x+1}{x^2-4x+3}$

$= \frac{x+1}{(x-1)(x-3)}$, $x = 1$ or 3

12. $y = \frac{\cos x}{x}$

$x = 0$

13. $y = \sqrt{2x+3}$

$\Rightarrow 2x+3 \geq 0$

$x \geq -\frac{2}{3}$

14. $y = (2x-1)^{\frac{1}{3}}$

$=$ All

15. $\lim_{x \to \pi} \sin(x - \sin x)$

$= \sin(\pi - \sin\pi)$

$= \sin(\pi - 0)$

$= \sin\pi$

$= 0$, π 連續

16. $\lim_{x\to 0} \tan\left[\frac{\pi}{4}\cos(\sin x^{\frac{1}{3}})\right]$

$= \tan\left[\frac{\pi}{4}\cos(\sin 0^{\frac{1}{3}})\right]$

$= \tan\left[\frac{\pi}{4}\cos(0)\right]$

$= \tan\left[\frac{\pi}{4}\cdot 1\right]$

$= 1$, 0連续

17. $f(x) = \begin{cases} x^2-1, & x<3 \\ 2ax, & x\geq 3 \end{cases}$

$\lim_{x\to 3} x^2-1 = \lim_{x\to 3} 2ax$

$\Rightarrow \quad 8 = 6a$

$a = \frac{4}{3}$

18. $f(x) = \begin{cases} a^2x-2a, & x\geq 2 \\ 12, & x<2 \end{cases}$

$\lim_{x\to 2} a^2x-2a = \lim_{x\to 2} 12$

$\Rightarrow \quad 2a^2-2a = 12$

$\Rightarrow \quad a^2-a = 6$

$\Rightarrow \quad a^2-a-6 = 0$

$\Rightarrow \quad (a-3)(a+2) = 0$

$a = 3$ or -2

19. $f(x) = \begin{cases} -2 & , x \le -1 \\ ax-b & , -1 < x < 1 \\ 3 & , x \ge 1 \end{cases}$

$\lim_{x \to -1} -2 = \lim_{x \to -1} ax-b$

$\Rightarrow \quad -2 = -a-b$

$\lim_{x \to 1} ax-b = \lim_{x \to 1} 3$

$\Rightarrow \quad a-b = 3$

$\begin{cases} a-b = 3 \\ -a-b = -2 \end{cases}$

$\begin{cases} a-b = 3 \\ a+b = 2 \end{cases}$

$2a = 5$

$a = \frac{5}{2}$

$b = -\frac{1}{2}$

20. $g(x) = \begin{cases} ax+2b & , x \le 0 \\ x^2+3a-b & , 0 < x \le 2 \\ 3x-5 & , x > 2 \end{cases}$

$\lim_{x \to 0} ax+2b = \lim_{x \to 0} x^2+3a-b$

$\Rightarrow \quad 2b = 3a-b$

$\lim_{x \to 2} x^2+3a-b = \lim_{x \to 2} 3x-5$

$\Rightarrow \quad 4+3a-b = 1$

$\begin{cases} 3a-3b = 0 \\ 3a-b = -3 \end{cases}$

$-2b = 3$

$b = -\frac{3}{2}$

$a = -\frac{3}{2}$