1. $y = \frac{1}{x}$

(a) $y = x^{-1}$

$y' = -1 \cdot x^{-2}$

$= -\frac{1}{x^2}$

$x = -1, \ -1$

(b) $-\frac{1}{x^2} = -\frac{1}{4}$

$x^2 = 4$

$x = 2$ or -2

$(2, \frac{1}{2})$ or $(-2, -\frac{1}{2})$

2. $S = 4.9t^2$

$S' = 4.9 \cdot 2 \cdot t^1$

$= 9.8t$

$t = 1, \ 9.8$

習題

1. $y = 4 - x^2$, $(-1, 3)$

$y' = -2x$, $x = -1$

$a = 2$

$y = 2x + b$, $(-1, 3)$

$3 = -2 + b$

$b = 5$ $\quad y = 2x + 5$

2. $y = 2\sqrt{x}$, $(1, 2)$

$y = 2x^{\frac{1}{2}}$

$y' = 2 \cdot \frac{1}{2} \cdot x^{-\frac{1}{2}}$

$= \frac{1}{\sqrt{x}}$, $x = 1$

$a = 1$

$y = x + b$, $(1, 2)$

$2 = 1 + b$

$b = 1$ $\quad y = x + 1$

3. $f(x) = x^2+1$, $(2,5)$

$f'(x) = 2x$

$f'(2) = 4$

$y-5 = 4(x-2)$

4. $h(t) = t^3$, $(2,8)$

$h'(t) = 3t^2$

$h'(2) = 12$

$y-8 = 12(t-2)$

5. $y = 5x-3x^2$, $x=1$

$y' = 5-6x$, $x=1$

$y' = -1$

6. $y = \frac{x-1}{x+1}$, $x=0$

$y = \frac{x+1-2}{x+1}$

$= \frac{x+1}{x+1} - \frac{2}{x+1}$

$= 1 - \frac{2}{x+1}$

$= 1 - 2(x+1)^{-1}$

$y' = -2 \cdot (-1)(x+1)^{-2} \cdot (1)$

$= \frac{2}{(x+1)^2}$, $x=0$

$y' = 2$

9. $A = \pi r^2$, $r = 3$

$A' = 2\pi r$, $r = 3$

$= 6\pi$

10. $V = \frac{4}{3}\pi r^3$, $r = 2$

$V' = \frac{4}{3} \cdot \pi \cdot 3r^2$

$= 4\pi r^2$, $r = 2$

$= 16\pi$