



■ 1  $y' = 8x^3 - 9x^2 + 2x$

■ 2  $f(x) = ax^2 + bx + 5$  より,  $f'(x) = 2ax + b$   
 $f'(0) = -2$ ,  $f'(-2) = 10$  より,  $b = -2$ ,  $-4a + b = 10$   
よって,  $a = -3$ ,  $b = -2$

■ 3 
$$\lim_{h \rightarrow 0} \frac{f(a+2h) - f(a-h)}{h} = \lim_{h \rightarrow 0} \frac{f(a+2h) - f(a) + f(a) - f(a-h)}{h}$$
$$= \lim_{h \rightarrow 0} \left\{ \frac{f(a+2h) - f(a)}{h} + \frac{f(a) - f(a-h)}{h} \right\}$$
$$= \lim_{h \rightarrow 0} \left\{ 2 \cdot \frac{f(a+2h) - f(a)}{2h} + \frac{f(a+(-h)) - f(a)}{-h} \right\}$$

ここで,  $2h = H$ ,  $-h = I$  とおくと,  $h \rightarrow 0$  のとき,  $H \rightarrow 0$ ,  $I \rightarrow 0$  であるから,

$$\lim_{H \rightarrow 0} 2 \cdot \frac{f(a+H) - f(a)}{H} + \lim_{I \rightarrow 0} \frac{f(a+I) - f(a)}{I} = 2f'(a) + f'(a) = 3f'(a)$$