前半の総演習

1. 次の極限値を求めよ.

(1) $\displaystyle\lim_{x \to 2}(x-1)$ (2) $\displaystyle\lim_{x \to -3} x^2$ (3) $\displaystyle\lim_{h \to 0} \frac{h^2 + 2h}{h}$

(4) $\displaystyle\lim_{x \to 2} \frac{x^2 - 3x + 2}{x - 2}$ (5) $\displaystyle\lim_{x \to 0} \frac{5x^2}{3x}$ (6) $\displaystyle\lim_{h \to 0} \frac{(3+h)^2 - 9}{h}$

2. 次の関数を微分せよ.

(1) $y = x^2$ (2) $y = x^3$ (3) $y = x^4$

(4) $y = 3x^2 - x - 5$ (5) $y = \dfrac{2}{3}x^3 - 4x^2 + 8$ (6) $y = x^5 - x^3 + 3x^2 + 3x - 5$

3. $f(x) = x^3 + x^2 - x + 4$ とするとき, 次の微分係数を計算せよ.

(1) $f'(-2)$ (2) $f'(-1)$ (3) $f'(0)$ (4) $f'(1)$

4. 次の関数を微分せよ (計算結果は展開して整理しなくてもよい).

(1) $y = \dfrac{1}{3x + 1}$ (2) $y = \dfrac{x}{2x - 3}$

(3) $y = (x + 1)(2x^3 - x^2 + 5x + 4)$ (4) $y = (2x + 5)^4$

(5) $y = (x^3 - 1)^3 - 1$ (6) $y = (x^2 - 5x - 5)^3$

(7) $y = (3x - 1)^3 + (3x - 1)^2 - (3x - 1) + 4$ (8) $y = (x - 1)(x + 1)^4$