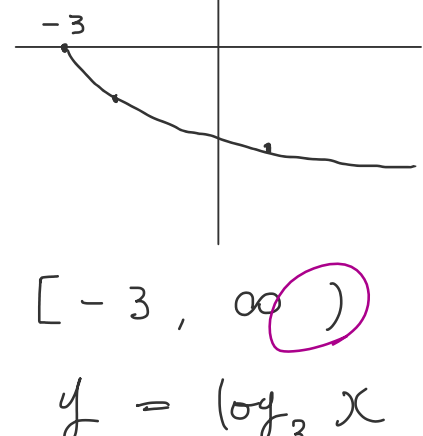


$$23 (1) (-\infty, -1) \cup (-1, \infty)$$

$$(2) x^2 + 1 \neq 0 \\ x^2 \neq -1 \\ x \neq \pm i$$

$$(-\infty, \infty)$$

$$(3) y = \sqrt{x} \text{ 在 } x \text{ 轴 } -3, y \text{ 轴 对称移动}$$



$$[-3, \infty)$$

$$(4) y = \log_2 x \text{ 在 } x \text{ 轴 } +4$$

$$(0, \infty) \text{ 在 } x \text{ 轴 } +4 \subset \mathbb{R}$$

$$(4, \infty)$$

$$(5) (-\infty, \infty)$$

$$(6) x - 2 \geq 0 \quad \wedge \quad \sqrt{x-2} \neq 0$$

$$\Rightarrow x - 2 > 0$$

$$x > 2$$

$$(2, \infty)$$

$$24 (1) \frac{\Delta y}{\Delta x} = \frac{(3 \cdot 4 + 5) - (3 \cdot 1 + 5)}{4 - 1}$$

$$= \frac{17 - 8}{3} = 3$$

$$(2) \frac{\Delta y}{\Delta x} = \frac{(-3^2 + 1) - (-(-1)^2 + 1)}{3 - (-1)}$$

$$= \frac{-8 - 0}{4} = -2$$

$$(3) \frac{\Delta y}{\Delta x} = \frac{b^2 - a^2}{b - a} = b + a$$

$$(4) \frac{\Delta y}{\Delta x} = \frac{(a+h)^3 - a^3}{(a+h) - a}$$

$$= \frac{3a^2h + 3ah^2 + h^3}{h}$$

$$= 3a^2 + 3ah + h^2$$

$$25 (1) f'(3) = \lim_{h \rightarrow 0} \frac{f(3+h) - f(3)}{h}$$

$$= \lim_{h \rightarrow 0} \frac{\{(3+h)^2 - 2(3+h)\} - \{3^2 - 2 \cdot 3\}}{h}$$

$$= \lim_{h \rightarrow 0} \frac{9 + 6h + h^2 - 6 - 2h - 9 + 6}{h}$$

$$= \lim_{h \rightarrow 0} \frac{h^2 + 4h}{h} = \lim_{h \rightarrow 0} (h + 4)$$

$$= 0 + 4 = 4$$

$$(2) f'(-1) = \lim_{h \rightarrow 0} \frac{f(-1+h) - f(-1)}{h}$$

$$= \lim_{h \rightarrow 0} \frac{\{(-1+h)^2 - 2(-1+h)\} - \{(-1)^2 - 2(-1)\}}{h}$$

$$= \lim_{h \rightarrow 0} \frac{1 - 2h + h^2 + 2 - 2h - 1 + 2}{h}$$

$$= \lim_{h \rightarrow 0} (h - 4)$$

$$= 0 - 4 = -4$$

$$(3) f'(a) = \lim_{h \rightarrow 0} \frac{f(a+h) - f(a)}{h}$$

$$= \lim_{h \rightarrow 0} \frac{\{(a+h)^2 - 2(a+h)\} - \{a^2 - 2a\}}{h}$$

$$= \lim_{h \rightarrow 0} \frac{a^2 + 2ah + h^2 - 2a - 2h - a^2 + 2a}{h}$$

$$= \lim_{h \rightarrow 0} (h + 2a - 2)$$

$$= 2a - 2$$

$$26 (1) y' = \lim_{h \rightarrow 0} \frac{\{5(x+h) + 1\} - \{5x + 1\}}{h}$$

$$= \lim_{h \rightarrow 0} 5h/h$$

$$= 5$$

$$(2) y' = \lim_{h \rightarrow 0} \frac{2(x+h)^2 - 2x^2}{h}$$

$$= \lim_{h \rightarrow 0} \frac{2x^2 + 4xh + 2h^2 - 2x^2}{h}$$

$$= 4x$$

$$(3) y' = \lim_{h \rightarrow 0} \frac{-(x+h)^3 - (-x^3)}{h}$$

$$= \lim_{h \rightarrow 0} \frac{-(x^3 + 3x^2h + 3xh^2 + h^3) + x^3}{h}$$

$$= \lim_{h \rightarrow 0} (-3x^2 - 3xh + h^2)$$

$$= -3x^2$$

$$27 (1) y' = (7x)' + (3)'$$

$$= 7$$

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

$$= 2 \cdot 3x^2 - 5$$

$$= 6x^2 - 5$$

$$(3) y' = \left(\frac{3}{2}x^5\right)' - \left(\frac{x}{2}\right)'$$

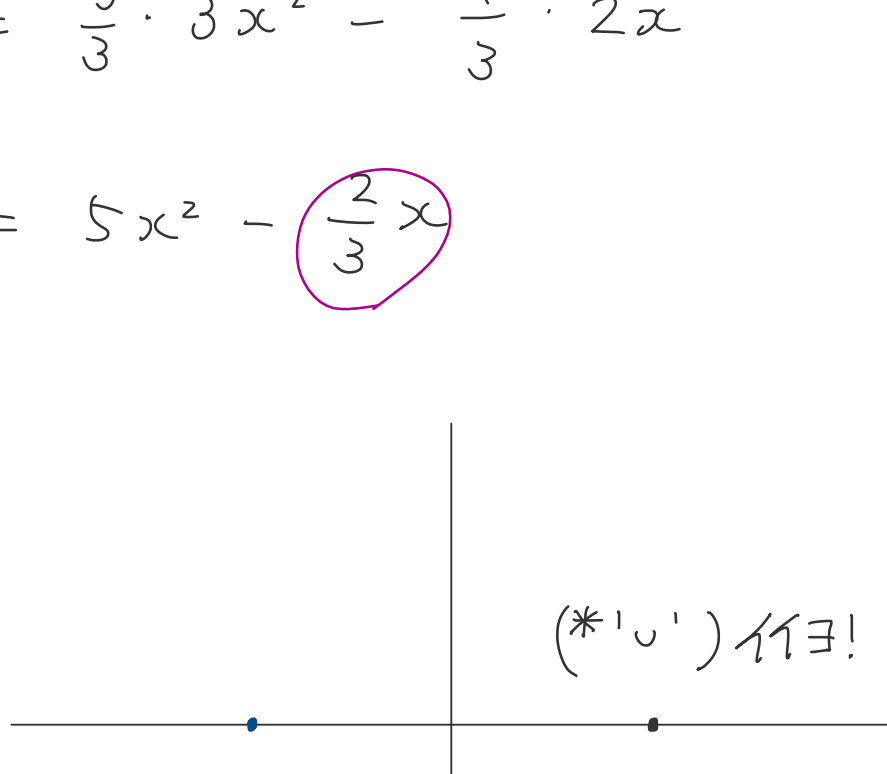
$$= \frac{3}{2} \cdot 5x^4 - \frac{1}{2}$$

$$= \frac{15x^4 - 1}{2}$$

$$(4) y' = \left(\frac{5}{3}x^3\right)' - \left(\frac{x^2}{3}\right)'$$

$$= \frac{5}{3} \cdot 3x^2 - \frac{1}{3} \cdot 2x$$

$$= 5x^2 - \frac{2}{3}x$$



$$(5) y' = -(2x^6)' + (4x^3)' - (3x)' + (1)'$$

$$= -2 \cdot 6x^5 + 4 \cdot 3x^2 - 3$$

$$= -12x^5 + 12x^2 - 3$$

$$28 (1) \frac{dV}{dr} = \frac{4}{3} \pi (r^3)'$$

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

$$= 4\pi r^2$$

$$(2) \frac{dq}{dp} = -(p^3)' + (2p)' - (5)'$$

$$= -3p^2 + 2$$

$$(3) \frac{dx}{dt} = (7t^2)' - (2t)' + (3)'$$

$$= 7 \cdot 2t - 2$$

$$= 14t - 2$$

$$29 (1) f'(x) = (2x)' - (7)'$$

$$= 2$$

$$f'(3) = 2$$

定义: 从, 在 场合

$$f'(3) = \lim_{h \rightarrow 0} \frac{f(3+h) - f(3)}{h}$$

$$= \lim_{h \rightarrow 0} \frac{\{2(3+h) - 7\} - \{2 \cdot 3 - 7\}}{h}$$

$$= 2$$

$$(2) f'(x) = 3 \cdot 2x - 1$$

$$= 6x - 1$$

$$f'(4) = 6 \cdot 4 - 1 = 23$$

$$(3) f'(x) = -3x^2 - 2 \cdot 2x$$

$$= -3x^2 - 4x$$

$$f'(-2) = -3(-2)^2 - 4(-2)$$

$$= -12 + 8 = -4$$

$$(4) f'(x) = \frac{5}{2} \cdot (4x^3) + \frac{1}{2} (2x)$$

$$= 10x^3 + x$$

$$f'(1) = 10 + 1 = 11$$

$$30 (1) \frac{dx}{dt} = 12 \cdot 1 - 3 \cdot (2t)$$

$$= 12 - 6t$$

$$(2) 12 - 6t = 0$$

$$6t = 12$$

$$t = 2$$

$$x = 12 \cdot 2 - 3 \cdot 2^2$$

$$= 24 - 12$$

$$= 12$$