

mc 1 p 70

$$a) \lim_{x \rightarrow 2} (x^4 - 4x^2 + 1) = 16 - 4 \cdot 4 + 1 = \textcircled{4}$$

$$b) \lim_{x \rightarrow +\infty} (x^4 - 4x^2 + 1) = \lim_{x \rightarrow +\infty} x^4 = \textcircled{+\infty}$$

$$\lim_{x \rightarrow -\infty} (x^4 - 4x^2 + 1) = \lim_{x \rightarrow -\infty} x^4 = \textcircled{+\infty}$$

$$c) \lim_{x \rightarrow -2} (x^4 - 3x^3 + 2x^2 - x) = 16 - 3(-8) + 2 \cdot 4 + 2 \\ = 16 + 24 + 8 + 2 = \textcircled{50}$$

$$d) \lim_{x \rightarrow +\infty} (-x^{11} + 100x^9 + 100\,000x^7)$$

$$= \lim_{x \rightarrow +\infty} (-x^{11}) = -(\textcircled{+\infty})^{11} = \textcircled{-\infty}$$

$$\lim_{x \rightarrow -\infty} (-x^{11} + 100x^9 + 100\,000x^7)$$

$$= \lim_{x \rightarrow -\infty} (-x^{11}) = -(-\infty)^{11} = -(-\infty) = \textcircled{+\infty}$$

$$e) \lim_{x \rightarrow 3} (-x(2x-1)^3) = -3(6-1)^3 = -3 \cdot 5^3 = -3 \cdot 125 = \textcircled{-375}$$

$$f) \lim_{x \rightarrow +\infty} (-x(2x-1)^3) = \lim_{x \rightarrow +\infty} (-8x^4) = -8 \cdot +\infty = \textcircled{-\infty}$$

$-x \cdot 8x^3 \dots$

$$\lim_{x \rightarrow -\infty} (-x(2x-1)^3) = \lim_{x \rightarrow -\infty} (-8x^4) = -8 \cdot +\infty = \textcircled{-\infty}$$

$$g) \lim_{x \rightarrow 1} (x^3 - 2ax^2 + (a^2-1)x + 1) = 1 - 2a + a^2 - 1 + 1 \\ = a^2 - 2a + 1 = \textcircled{(a-1)^2}$$

$$h) \lim_{x \rightarrow +\infty} (x^3 - 2ax^2 + (a^2-1)x + 1) = \lim_{x \rightarrow +\infty} x^3 = \textcircled{+\infty}$$

$$\lim_{x \rightarrow -\infty} (x^3 - 2ax^2 + (a^2-1)x + 1) = \lim_{x \rightarrow -\infty} x^3 = \textcircled{-\infty}$$