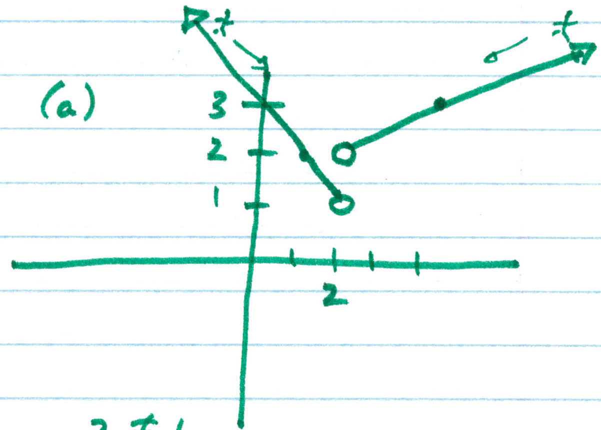
2.1

(5) $\lim\limits_{x \to c} (2x^3 - 3x^2 + x - 1) = \boxed{2c^3 - 3c^2 + c - 1}$

(51) $f(x) = \begin{cases} 3 - x, & x < 2 \\ \frac{x}{2} + 1, & x > 2 \end{cases}$

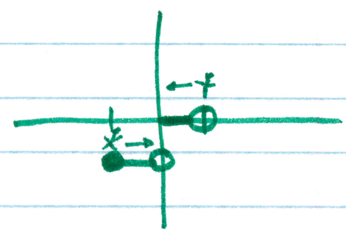
(a)



(b) $\lim\limits_{x \to 2^+} f(x) = 2$

$\lim\limits_{x \to 2^-} f(x) = 1$ (c) no, $2 \neq 1$

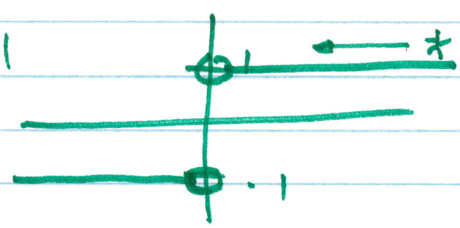
(31) $\lim\limits_{x \to 0^+} \operatorname{int} x$ $\lim\limits_{x \to 0^+} [[x]] = 0$



$\lim\limits_{x \to 0^-} \operatorname{int} x = -1 \leftarrow y$

$x \longrightarrow$

(35) $\lim\limits_{x \to 0^+} \frac{x}{|x|} = 1$



$(2+x)(2+x)(2+x)$

$(4+4x+x^2)(2+x)$

$8+8x+2x^2+4x+4x^2+x^3$

(23) $\lim\limits_{x \to 0} \frac{(2+x)^3 - 8}{x} = \lim\limits_{x \to 0} \frac{\cancel{8}+12x+6x^2+x^3\cancel{-8}}{x}$ $\lim\limits_{x \to 0} \frac{\cancel{x}(12+6x+x^2)}{\cancel{x}}$

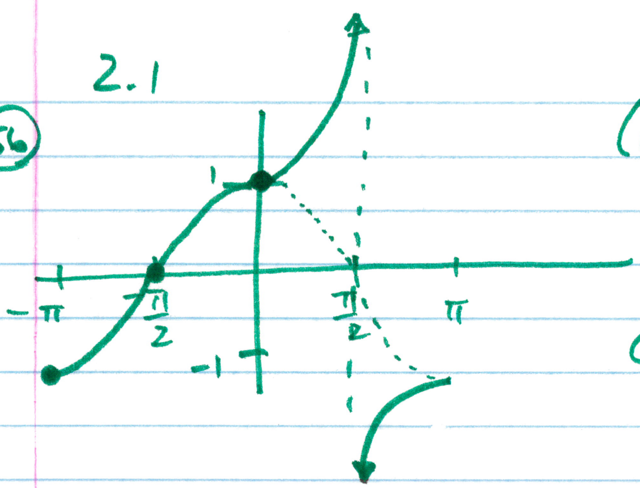
$\lim\limits_{x \to 0} 12+6x+x^2 = 12$

(27) $\lim\limits_{x \to 0} \frac{\sin^2 x}{x} = \lim\limits_{x \to 0} \frac{\sin x}{x} \cdot \sin x = \underbrace{\lim\limits_{x \to 0} \frac{\sin x}{x}}_{} \cdot \lim\limits_{x \to 0} \sin x$

$1 \cdot 0 = 0$

2.1

(56)



(b) $\left(-\pi, \frac{\pi}{2}\right) \cup \left(\frac{\pi}{2}, \pi\right)$

(c) π

(d) $-\pi$

$$\frac{\sin(\ \ )}{(\ \ )}$$

$x \neq 0$

(28) $$\lim_{x \to 0} \frac{3x \sin 4x}{x \sin 3x} = \lim_{x \to 0} 4 \frac{\sin 4x}{4x} \cdot \frac{3x}{\sin 3x}$$

$$= \lim_{x \to 0} 4 \cdot \lim_{x \to 0} \frac{\sin 4x}{4x} \cdot \lim_{x \to 0} \frac{3x}{\sin 3x}$$

$$\frac{3 \sin 4x}{\sin 3x}$$

$$\lim_{x \to 0} 4 \cdot \lim_{x \to 0} \frac{\sin 4x}{4x} \div \lim_{x \to 0} \frac{\sin 3x}{3x}$$

$$\lim_{x \to 0} \frac{\sin x}{x} = 1$$

$$4 \cdot 1 \div 1 = 4$$