

3-4

~~7~~

8

2-3

$\lim_{x \rightarrow 0} \frac{\sqrt{x+1}-1}{x} = \dots$

- (a) zero (b)  $\sqrt{2}$  (c)  $\frac{1}{2}$  (d) does not exist.

$\frac{(x+1)^{\frac{1}{2}} - 1^{\frac{1}{2}}}{x} = \frac{1}{2} \cdot 1^{\frac{1}{2}-1} = \frac{1}{2} \cdot 1^{-\frac{1}{2}} = \frac{1}{2} \cdot 1 = \frac{1}{2}$

$\frac{n}{m} a^{n-m}$

$\lim_{x \rightarrow a} \frac{(x+a)^n - a^n}{x} = n a^{n-1}$

$\lim_{x \rightarrow a} \frac{x^n - a^n}{x^m - a^m} = \frac{n}{m} a^{n-m}$

Find: (1)  $\lim_{x \rightarrow 2} \frac{x^2 - 4}{x^2 - 5x + 6}$

(2)  $\lim_{x \rightarrow -1} \frac{x^3 - 7x - 6}{x^3 + 3x^2 + 2x}$

$\lim_{x \rightarrow 2} \frac{(x-2)(x+2)}{(x-2)(x-3)} = \frac{4}{-1} = -4$

(2)  $\lim_{x \rightarrow -1} \frac{x^3 - 7x - 6}{x(x^2 + 3x + 2)} = \lim_{x \rightarrow -1} \frac{x^3 - 7x - 6}{x(x+1)(x+2)}$

error

(x+1)

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

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

$\frac{-6x}{x} = -6$

$\lim_{x \rightarrow -1} \frac{(x+1)(x^2 - x - 6)}{x(x+1)(x+2)}$

$\frac{(-1)^2 - (-1) - 6}{-1(-1+2)} = \frac{1 + 1 - 6}{-1(1)} = \frac{-4}{-1} = 4$

$\frac{x^2 - x - 6}{x^3 + x^2 - 7x - 6}$

$\frac{-x^2 - 7x - 6}{-x^2 - x}$

$\frac{-x^2 - x}{-x^2 - x}$

$\frac{-6x - 6}{-6x - 6}$

$\frac{-6x - 6}{-6x - 6} = 1$

# ① Direct sub.

$$\lim_{x \rightarrow \frac{\pi}{2}} (2x - \cos x) = \frac{2 * \frac{\pi}{2} - \cos \frac{\pi}{2}}{1} = \pi$$

(a) zero      (b) 2      (c)  $\pi$       (d)  $\frac{\pi}{2}$

lim  $\frac{\text{zero}}{\text{zero}}$

$$\frac{\text{zero}}{\text{zero}} = \text{undefin}$$

$$\frac{\text{zero}}{\square} = \text{zero}$$