

Algebraic Limits

Note title

8/27/2013

$$\textcircled{1} \lim_{x \rightarrow -2} x^2 - 4x + 1 = (-2)^2 - 4(-2) + 1 = 4 + 8 + 1 = \boxed{13}$$

$$\textcircled{2} \lim_{x \rightarrow -2} \frac{2x - 6}{x - 2} = \frac{2(-2) - 6}{-2 - 2} = \frac{-4 - 6}{-4} = \boxed{\frac{5}{2}}$$

$$\textcircled{3} \lim_{x \rightarrow -2} \frac{x^2 - 2x - 8}{x^2 - 4} = \frac{(-2)^2 - 2(-2) - 8}{(-2)^2 - 4} = \frac{4 + 4 - 8}{4 - 4} = \boxed{0}$$

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

$$= \frac{-4}{-4} = \boxed{\frac{2}{1}}$$

4)

$$\lim_{x \rightarrow 1} \frac{x^2 - 2x + 1}{x^3 - 1} = \frac{(1)^2 - 2(1) + 1}{(1)^3 - 1} = \frac{1 - 2 + 1}{1 - 1} = \frac{0}{0}$$

$$\lim_{x \rightarrow 1} \frac{(x-1)(x-1)}{(x-1)(x^2+x+1)} \lim_{x \rightarrow 1} \frac{x-1}{x^2+x+1} = \frac{1-1}{1+1+1} = \frac{0}{3}$$

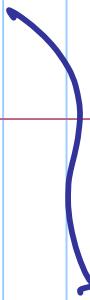
$$x^3 - 1$$

$$a = x \quad b = 1$$

$$= 0$$

$$a^3 + b^3 = (a+b)(a^2 - ab + b^2)$$

$$a^3 + b^3 = (a+b)(a^2 - ab + b^2)$$



$$5) \lim_{x \rightarrow 9}$$

$$\frac{\sqrt{x} - 3}{x - 9} =$$

$$\frac{\sqrt{9} - 3}{9 - 9} = \frac{0}{0}$$

$$\lim_{x \rightarrow 9}$$

$$\frac{\sqrt{x} - 3}{x - 9} \left[\frac{\sqrt{x} + 3}{\sqrt{x} + 3} \right] =$$

$$\frac{x + 3\sqrt{x} - 3\sqrt{x} - 9}{(x - 9)(\sqrt{x} + 3)} =$$

* only multiply conjugates

$$\lim_{x \rightarrow 9}$$

$$\frac{x - 9}{(x - 9)(\sqrt{x} + 3)} =$$

$$\lim_{x \rightarrow 9}$$

$$\frac{1}{\sqrt{x} + 3} =$$

$$\frac{1}{\sqrt{9} + 3} =$$

$$= \frac{1}{3+3} = \boxed{\frac{1}{6}}$$