Calculus Exercise Week1

Chapter 1 review

315. $D(g)=\{x-5>0\}=\{x>5\}$

$R(g)=\mathbb{R}$

317. $g\circ f=g(f(x))=\ln(x^2+2x-3-5)=\ln(x^2+2x-8)$, $D(g\circ f)=\{x^2+2x-8>0\}$

$=\{x<-4 \text{ 或 } x>2\}$

$R(g\circ f)=\mathbb{R}$

319. degree: 3

y-intercept: $x=0\Rightarrow f(0)=0^3+2\times0^2-2\times0=0$

zeros: $f(x)=x^3+2x^2-2x=0\Rightarrow x=0/-1+\sqrt{3}/-1-\sqrt{3}$

325. $\log_2(x+4)=3\Rightarrow x+4=2^3\Rightarrow x=4$

329 ① $D_{max}(f)=\{x\geq-\frac{3}{2}\}$

$f^{-1}(x)=\frac{-3+\sqrt{4x-7}}{2}$

~~② $D_{max}(f)=\{x<-\frac{3}{2}\}$~~

~~$f^{-1}(x)=\frac{-3-\sqrt{4x-7}}{2}$~~

Section 2.2:

46. ✓

47. $\lim_{x\to-2^+}f(x)=+\infty$

48. X, $\lim_{x\to8}f(x)=4$, $f(8)=-3$

49. X, $\lim_{x\to6^-}f(x)=2$, $\lim_{x\to6^+}f(x)=5$, $\lim_{x\to6}f(x)$ doesn't exist

50. $\lim_{x\to1^-}f(x)=1$

51. $\lim_{x\to1^+}f(x)=2$

52. $\lim_{x\to1}f(x)$ 不存在

53. $\lim_{x\to2}f(x)=1$

54. $f(1)=1$

Section 2.3

93. $\lim_{x\to4}\frac{x^2-16}{x-4}=\lim_{x\to4}\frac{(x-4)(x+4)}{x-4}=8$

95. $\lim_{x\to 6} \frac{3x-18}{2x-12} = \lim_{x\to 6} \frac{3(x-6)}{2(x-6)} = \frac{3}{2}$

97. $\lim_{t\to 9} \frac{t-9}{\sqrt{t}-3} = \lim_{t\to 9} \frac{(\sqrt{t}-3)(\sqrt{t}+3)}{\sqrt{t}-3} = 6$

103. $\lim_{x\to -2^-} \frac{2x^2+7x-4}{x^2+x-2} = \lim_{x\to -2^-} \frac{(2x-1)(x+4)}{(x-1)(x+2)} = \lim_{x\to -2} \frac{10}{3} \frac{1}{x+2} = -\infty$

105. $\lim_{x\to 1^-} \frac{2x^2+7x-4}{x^2+x-2} = \lim_{x\to 1^-} \frac{(2x-1)(x+4)}{(x+2)(x-1)} = \frac{5}{3} \cdot -\infty = -\infty$

107. $\lim_{x\to 6} 2f(x)g(x) = 2\times 4\times 9 = 72$

109. $\lim_{x\to 6} (f(x) + \frac{1}{3}g(x)) = 4 + \frac{1}{3}\times 9 = 7$