

$$1. \lim_{x \rightarrow 6} \frac{x^2 - 11x + 30}{x^3 - 16x^2 + 85x - 150} = \lim_{x \rightarrow 6} \frac{(x-5)(x-6)}{(x-5)(x-6)} = \lim_{x \rightarrow 6} \frac{1}{(x-5)} = 1$$

$$2. \lim_{x \rightarrow 7} \frac{x}{\sqrt{x+2} - 3} = \lim_{x \rightarrow 7} \frac{x}{\sqrt{x+2} - 3} \cdot \frac{\sqrt{x+2} + 3}{\sqrt{x+2} + 3} = \lim_{x \rightarrow 7} \frac{x(\sqrt{x+2} + 3)}{x - 7}$$

左極限 \neq 右極限

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

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

Ans: DNE

$$3. (a) \lim_{x \rightarrow 3} 2x + 3 = 9 \quad (b) \lim_{x \rightarrow \frac{\pi}{3}} \cos x = \frac{1}{2}$$

(c) 題目設計有誤, 下列兩種答案都算對。

$$\lim_{x \rightarrow \frac{17}{12}\pi} g(f(x)) = \lim_{x \rightarrow \frac{17}{12}\pi} \cos(2x + 3) = \cos\left(-\frac{17}{6}\pi + 3\right)$$

$$\text{or} \\ \cos\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}$$

兩者
都給對