(1) [5] Let $u(t) = \sqrt{\cos(t)}$. Find functions f and g so that $u(t) = (f \circ g)(t)$.

Let $g(t) = \cos(t)$

$f(t) = \sqrt{t}$

Then $(f \circ g)(t) = f(g(t))$

$= \sqrt{g(t)}$

$= \sqrt{\cos(t)}$ ✓

(2) [5] Evaluate the limit, if it exists:

$$\lim_{x \to 2} \frac{x^2 + x - 6}{x - 2} \quad \sim \text{"}\frac{0}{0}\text{"}$$

$$= \lim_{x \to 2} \frac{(x-2)(x+3)}{(x-2)}$$

$$= \boxed{5}$$

(3) [5] Evaluate the limit, if it exists:

$$\lim_{x\to 7} \frac{\sqrt{x+2}-3}{x-7} \qquad \sim \text{"}\frac{0}{0}\text{"}$$

$$= \lim_{x\to 7} \frac{\sqrt{x+2}-3}{x-7} \cdot \frac{\sqrt{x+2}+3}{\sqrt{x+2}+3}$$

$$= \lim_{x\to 7} \frac{x+2-9}{(x-7)(\sqrt{x+2}+3)}$$

$$= \lim_{x\to 7} \frac{\cancel{(x-7)}}{\cancel{(x-7)}(\sqrt{x+2}+3)}$$

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