1. $\lim_{x \to 2} f(x) = 1$

2. $\lim_{x \to -1} f(x) = DNE$

3.

A2. $\lim_{x \to 0} \dfrac{\left(\sqrt{x+4} - 2\right)}{x} = 0.25$

x	-0.1	$-0.0\ 1$	-0.001	0	0.001	0.01	0. 1
$f(x)$	$f(-.1) =$ 0.2515823400	$f(-.01) =$ 0.2501564000	$f(-.001) =$ 0.2500160000	?	$f(.001) =$ 0.2499840000	$f(0.01) =$ 0.2498439000	$f(.1) =$ 0.2484567300

4. $f(x)$ is discontinuous at $x = -1$ because $f(-1)$ = undefined. (Removable)

$f(x)$ is discontinuous at $x = 2$ because $\lim_{x \to 2} f(x)$ = DNE . (Non-Removable)

5. $f(x)$ is discontinuous at $x = 1$ because

$\lim_{x \to 1^-} f(x) = -1$ and $\lim_{x \to 1^+} f(x) = 2$

which means $\lim_{x \to 1} f(x) = DNE.$

(Non-Removable)

6. For the proof, choose $\delta = \dfrac{\varepsilon}{2}$.

7. For the proof, choose $\delta = \dfrac{\varepsilon}{7}$ on the interval $2 \le x \le 4$.

8. $f'(x) = \lim_{\Delta x \to 0} \dfrac{\left(f(x + \Delta x) - f(x)\right)}{\Delta x} = 2$

9. $f'(x) = \lim_{\Delta x \to 0} \dfrac{\left(f(x + \Delta x) - f(x)\right)}{\Delta x} = 2x - 3$

10. $\int_1^4 (2x + 3)\, dx = \lim_{n \to \infty} \sum_{i=1}^{n} f(c_i) \Delta x = 24$

where: $\Delta x = \dfrac{3}{n}$ and > $c_i = 1 + \dfrac{3}{n} i$

11. $\int_0^5 (x^2 - 2x)\, dx = \lim_{n \to \infty} \sum_{i=1}^{n} f(c_i) \Delta x = \dfrac{50}{3}$

where: $\Delta x = \dfrac{5}{n}$ and > $c_i = 0 + \dfrac{5}{n} i$