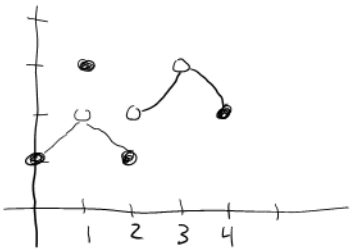
§2.6



(10) Discontinuous at:

$x = 1$ ③ fails
$x = 2$ ②, ③ fail
$x = 3$ ①, ③ fail

(14) $f(x) = \dfrac{2x^2 + 3x + 1}{x^2 + 5x}$ at $x = -5$

Note: $f(-5)$ is undefined, so ① fails

Therefore f is not continuous at $x = -5$

(32) $\lim\limits_{x \to 4} \tan\left(\dfrac{x-4}{\sqrt{x}-2}\right) = \tan\left(\lim\limits_{x \to 4} \dfrac{x-4}{\sqrt{x}-2}\right) = \tan\left(\lim\limits_{x \to 4} \dfrac{x-4}{\sqrt{x}-2} \dfrac{\sqrt{x}+2}{\sqrt{x}+2}\right)$

$= \tan\left(\lim\limits_{x \to 4} \dfrac{(x-4)(\sqrt{x}+2)}{x-4}\right) = \tan\left(\lim\limits_{x \to 4} (\sqrt{x}+2)\right) = \tan(\sqrt{4}+2)$

$= \boxed{\tan(4)} \approx \boxed{1.15782}$ ← by calculator

(36) State the intervals of continuity for the function from (10)

The function is continuous on $[0,1)$ $(1,2]$, $(2,3)$, $(3,4]$

(52) $f(x) = e^{\sqrt{x}}$ is continuous on $[0,\infty)$ because $\sqrt{x}$ is continuous there and e^x is continuous everywhere

$\lim\limits_{x \to 4} e^{\sqrt{x}} = e^{\lim\limits_{x \to 4} \sqrt{x}} = e^{\sqrt{4}} = \boxed{e^2}$

$\lim\limits_{x \to 0^+} e^{\sqrt{x}} = e^{\lim\limits_{x \to 0^+} \sqrt{x}} = e^0 = \boxed{1}$

(76) $\lim\limits_{x \to 0^+} \dfrac{1 - \cos^2(x)}{\sin(x)} = \lim\limits_{x \to 0^+} \dfrac{\sin^2(x)}{\sin(x)} = \lim\limits_{x \to 0^+} \sin(x) = \sin(0) = \boxed{0}$

Note, because $1 = \sin^2(x) + \cos^2(x)$
it follows that $1 - \cos^2(x) = \sin^2(x)$