2.2. 34. $\lim_{x \to 3^-} \frac{\sqrt{x}}{(x-3)^5}$

$(x-3)^5 < 0$ when $x < 3$,

$\lim_{x \to 3^-} (x-3)^5 = 0$,

$\lim_{x \to 3^-} \sqrt{x} = \sqrt{3}$,

So $\lim_{x \to 3^-} \frac{\sqrt{x}}{(x-3)^5} = -\infty$

2.2. 54. $\lim_{v \to c^-} \frac{m_0}{\sqrt{1 - v^2/c^2}}$

When $v < c$, $\frac{v^2}{c^2} < 1$,

so $1 - v^2/c^2 > 0$, and its sqrt is greater than 0. And $m_0 \geq 0$, so

$\lim_{v \to c^-} \frac{m_0}{\sqrt{1 - v^2/c^2}} = \infty$

2.3. 26. $\lim_{t \to 0} \left(\frac{1}{t} - \frac{1}{t^2 + t} \right) =$

$\lim_{t \to 0} \frac{t + 1 - 1}{t^2 + t} =$

$\lim_{t \to 0} \frac{1}{t + 1} = 1$

2.3. 30.

$$\lim_{x \to -4} \frac{\sqrt{x^2+9}-5}{x+4} =$$

$$\lim_{x \to -4} \frac{\left(\sqrt{x^2+9}-5\right)\left(\sqrt{x^2+9}+5\right)}{(x+4)\left(\sqrt{x^2+9}+5\right)} =$$

$$\lim_{x \to -4} \frac{x^2+9-25}{(x+4)\left(\sqrt{x^2+9}+5\right)} =$$

$$\lim_{x \to -4} \frac{(x+4)(x-4)}{(x+4)\left(\sqrt{x^2+9}+5\right)} =$$

$$\lim_{x \to -4} \frac{x-4}{\sqrt{x^2+9}+5} =$$

$$\lim_{x \to -4} \frac{x-4}{10} = -\frac{4}{5}$$

2.3. 32.

$$\lim_{h\to 0} \frac{\frac{1}{(x+h)^2} - \frac{1}{x^2}}{h} =$$

$$\lim_{h\to 0} \frac{\frac{x^2}{(x+h)^2x^2} - \frac{(x+h)^2}{(x+h)^2x^2}}{h} =$$

$$\lim_{h\to 0} \frac{x^2 - x^2 - 2xh - h^2}{(x+h)^2x^2h} =$$

$$\lim_{h\to 0} \frac{-2xh}{(x+h)^2x^2h} =$$

$$\lim_{h\to 0} \frac{-2}{(x+h)^2x} =$$

$$\frac{-2}{x^3}$$

2.3. 44.

$$\lim_{x\to -2} \frac{2-|x|}{2+x}$$

$$\cancel{\lim_{x\to -2^-} \frac{2-|x|}{2+x}}$$

$$\lim_{x\to -2} 2-|x| = \lim_{x\to -2} 2+x .$$

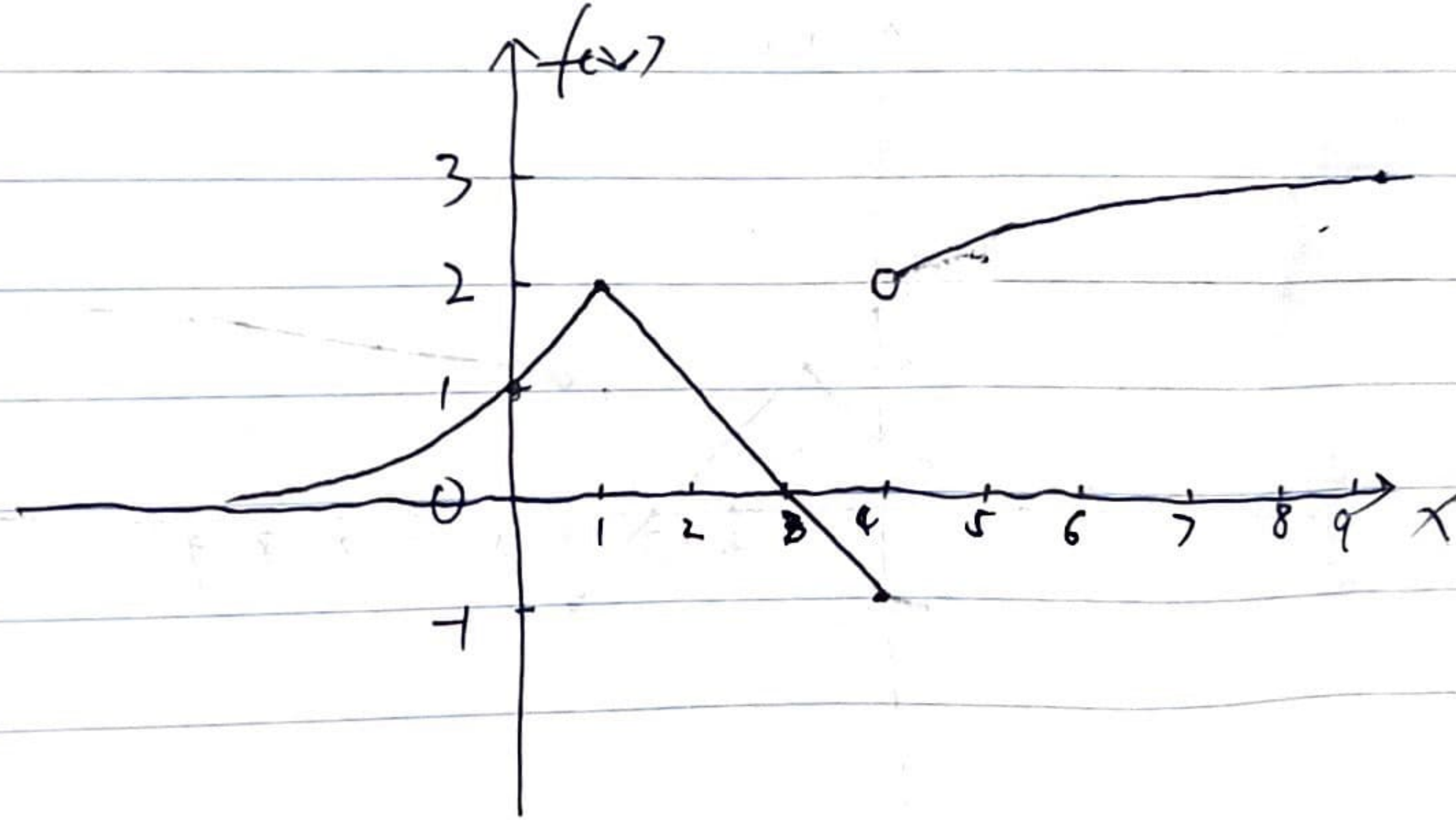
so $\displaystyle \lim_{x\to -2} \frac{2-|x|}{2+x} = \lim_{x\to -2} \frac{2+x}{2+x} = 1$

2.5. 42.

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

$$\lim_{x\to 4^-} f(x) = -1 \neq \lim_{x\to 4^+} f(x) = 2.$$

so $f(x)$ is continuous for $x \le 4$.



2.5. 44. When $r=R$,

$$\lim_{r\to R^-} \frac{GMr}{R^3} = \frac{GMR}{R^3} = \frac{GM}{R^2}$$, and

$$\lim_{r\to R^+} \frac{GM}{r^2} = \frac{GM}{R^2}$$. So, $\lim_{r\to R^+} F(r) = \lim_{r\to R^-} F(r) = F(r)$.

It is a continuous function of r.