

(8) Any polynomial  $p(x)$  is continuous on  $\mathbb{R}$  since  $\lim_{x \rightarrow c} p(x) = p(c)$ .

(9) Any rational function  $f(x) = \frac{p(x)}{q(x)}$ , where  $p(x)$  and  $q(x)$  are polynomials, is continuous on  $\{x : q(x) \neq 0\}$  since  $\lim_{x \rightarrow c} \frac{p(x)}{q(x)} = \frac{p(c)}{q(c)}$  on this set.

(10)  $f(x) = \frac{x^2 - 1}{x - 1}$  is continuous except at  $x = 1$ . Since

$$\lim_{x \rightarrow 1} \frac{x^2 - 1}{x - 1} = \lim_{x \rightarrow 1} \frac{(x + 1)(x - 1)}{x - 1} = \lim_{x \rightarrow 1} (x + 1) = 2,$$

the discontinuity at  $x = 1$  is removable. Thus

$$F(x) = \begin{cases} \frac{x^2 - 1}{x - 1}, & \text{if } x \neq 1 \\ 2, & \text{if } x = 1 \end{cases} = x + 1$$

is continuous on  $\mathbb{R}$ .

### Homework

Page 124 # 5, 7, 8, 12

Pag 129 # 8 (Hint: Use Problem 8 from Page 124)