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**2.** Determine the domain and range of the following functions.

a)  $y = \frac{-2}{4(x+5)} - 7$

dom =  $\mathbb{R} \setminus \{-5\}$ ; ran =  $\mathbb{R} \setminus \{-7\}$

b)  $y = \frac{3}{2(x-1)} + 4$

dom =  $\mathbb{R} \setminus \{1\}$ ; ran =  $\mathbb{R} \setminus \{4\}$

**3.** Determine the zero and initial value of the following functions.

a)  $y = \frac{3}{x-5} + 4$

Zero:  $\frac{17}{4}$ ; i.v.:  $\frac{17}{5}$

b)  $y = \frac{-2}{3(x+1)}$

Zero: none; i.v.:  $-\frac{2}{3}$

c)  $y = \frac{-5}{4x} + 10$

Zero:  $\frac{1}{8}$ ; i.v.: none

**4.** Determine the interval over which the function  $f(x) = \frac{-4}{5(x-1)} + 3$  is positive.  $[-\infty, 1] \cup \left[ \frac{19}{15}, +\infty \right]$

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**5.** Determine the interval over which the function  $f(x) = \frac{3}{2(x+2)} - 1$  is strictly positive.  $[-2, \frac{-1}{2}]$

**6.** Study the variation of the function  $f(x) = \frac{-2}{5(x-1)} + 4$ .  $f > 0$  over  $\mathbb{R} \setminus \{1\}$

**7.** Consider the functions  $f(x) = -2|x+4| + 5$ ,  $g(x) = 3\sqrt{x-3} + 2$ ,  $h(x) = \frac{6}{5(x-1)} + \frac{22}{5}$  and  $i(x) = 3\left[\frac{1}{4}(x-2)\right] + 1$ . Determine  $f \circ g \circ h \circ i(1) = \underline{\hspace{2cm}}^3$

**8.** Given  $f(x) = \frac{3}{2(x-4)} + 1$  and  $g(x) = 3x - 1$ . Determine, in standard form, the rule of the function  $f \circ g$ .  $f \circ g(x) = f(3x-2) = \frac{3}{2(3x-6)} + 1 = \frac{1}{2(x-2)} + 1$