

HW p. 122 5-8

$$5. a) \frac{2(x+1)}{3} \times \frac{x-1}{6(x+1)}$$

$$= \frac{x-1}{9}$$

$$x \neq -1$$

$$b) \frac{3a-6}{a+2} \div \frac{a-2}{a+2}$$

$$= \frac{3(a-2)}{a+2} \times \frac{a+2}{a-2}$$

$$= 3$$

$$a \neq -2, 2$$

$$c) \frac{2(x-2)}{3} \times \frac{4x^4}{2-x}$$

$$= \frac{8x(x+2)}{-3(x-2)}$$

$$= -\frac{8x}{3} \quad x \neq 0, 2$$

$$d) \frac{3(m+4)^2}{2m+1} \div \frac{5(m+4)}{7m+14}$$

$$= \frac{3(m+4)^2}{2m+1} \times \frac{7(m+2)}{5(m+4)}$$

$$= \frac{21(m+4)(m+2)}{5(2m+1)}$$

$$m \neq -4, -2, -\frac{1}{2}$$

$$6. a) \frac{(x+1)(x/3)}{(x+2)^2} \times \frac{2(x+2)}{(x/3)(x+3)}$$

$$= \frac{2(x+1)}{(x+2)(x+3)} \quad x \neq -2, \pm 3$$

$$c) \frac{2x^2 - x - 1}{x^2 - x - 6} \times \frac{6x^2 - 5x + 1}{8x^2 + 14x + 5}$$

$$= \frac{(2x+1)(x-1)}{(x-3)(x+2)} \times \frac{(3x-1)(2x-1)}{(2x+1)(4x+5)}$$

$$= \frac{(x-1)(3x-1)(2x-1)}{(x-3)(x+2)(4x+5)}$$

$$x \neq -2, -\frac{5}{4}, -\frac{1}{2}, 3$$

$$7. a) \frac{x^2 - 5xy + 4y^2}{x^2 + 3xy - 28y^2} \times \frac{x^2 + 2xy + y^2}{x^2 - y^2}$$

$$= \frac{(x-4y)(x-y)}{(x+7y)(x-4y)} \times \frac{(x+y)^2}{(x/y)(x/y)}$$

$$= \frac{x+y}{x+7y}$$

$$x \neq \pm y, -7y, 4y$$

$$b) \frac{2(n^2 - 7n + 12)}{n^2 - n - 6} \div \frac{5(n-4)}{n^2 - 4}$$

$$= \frac{2(n-4)(n/3)}{(n/3)(n+2)} \div \frac{5(n-4)}{(n-2)(n+2)}$$

$$= \frac{2(n/4)}{(n/2)} \times \frac{(n-2)(n/2)}{5(n/4)}$$

$$= \frac{2(n-2)}{5} \quad n \neq \pm 2, 3, 4$$

$$d) \frac{9y^2 - 4}{4y - 12} \div \frac{9y^2 + 12y + 4}{18 - 6y}$$

$$= \frac{(3y+2)(3y-2)}{4(y-3)} \div \frac{(3y+2)^2}{-6(y-3)}$$

$$= \frac{(3y+2)(3y-2)}{2 \cancel{4}(y/3)} \times \frac{-\cancel{3}6(y/3)}{(3y+2)^2}$$

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

$$y \neq -\frac{2}{3}, 3$$

$$b) \frac{2a^2 - 12ab + 18b^2}{a^2 - 7ab + 10b^2} \div \frac{4a^2 - 12ab}{a^2 - 7ab + 10b^2}$$

$$= \frac{2(a^2 - 6ab + 9b^2)}{(a-5b)(a-2b)} \div \frac{4a(a-3b)}{(a-5b)(a-2b)}$$

$$= \frac{2(a-3b)^2}{(a/5b)(a-2b)} \times \frac{(a/5b)(a/2b)}{\frac{4a(a/3b)}{2}}$$

$$= \frac{a-3b}{2a}$$

$$a \neq 0, 3b, 2b, 5b$$

$$x \neq 0, 1, \pm 2, -3, \frac{2}{3}$$

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

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

$$= \frac{1}{(x+3)(x-2)} \times \frac{(x+3)(x-1)}{x} \div \frac{3x}{(x+2)(x-2)}$$

$$8. \frac{x^2 + x - 6}{(2x-1)^2} \times \frac{x(2x-1)^2}{x^2 + 2x - 3} \div \frac{x^2 - 4}{3x}$$

← cancel, but incl. restriction

$$x \neq \pm \frac{3}{4}, -\frac{2}{4}, 0$$

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

$$= \frac{(5x-y)(2x+y)}{4(3x+y)} \times \frac{3x(2x+y)}{4(3x+y)}$$

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

$$7.c) \frac{9x^2 - y^2}{6x^2 + 3xy} \div \frac{12x + 4y}{10x^2 + 3xy - y^2}$$

$$m \neq -n, -\frac{5}{2}n, \frac{1}{2}n$$

$$= \frac{2(m+n)}{-(3m-n)(m-n)}$$

$$= \frac{(3m-n)}{(7m-n)(m-n)} \times \frac{-2(7m/n)}{(m+n)}$$

$$= \frac{(5m/2n)(3m-n)}{(7m-n)(m-n)} \times \frac{2(n-7m)}{(5m/2n)(m+n)}$$

$$d) \frac{15m^2 + mn - 2n^2}{7m^2 - 8mn + n^2} \times \frac{2n - 4m}{5m^2 + 7mn + 2n^2}$$