Multiplication and Division of Rational Expressions

Simplify and state the non-permissible values.

a. $\dfrac{x^2+x-6}{3x^2+5x-12}\cdot\dfrac{2x^2-14x}{16x^2-4x}\cdot\dfrac{12x^2-19x+4}{x^2+5x-14}$

b. $\dfrac{x^2-9}{x^2-x-6}\div\dfrac{2x^2+x-15}{x^2+7x+10}\cdot\dfrac{2x^2-x-10}{x^2-25}$

c. $\dfrac{3x^2+10x-8}{x^2+4x+3}\cdot\dfrac{x^2+6x+9}{3x^2-5x+2}\div\dfrac{x^2+x-12}{x^2-1}$

d. $\dfrac{2m^2+5m-12}{m^2+9m+14}\div\dfrac{16-m^2}{m^2+3m-28}\div\dfrac{6m^2-7m-3}{3m^2+25m+8}$

e. $\dfrac{\dfrac{16x^2-9}{6-5x-4x^2}}{\dfrac{16x^2+24x+9}{4x^2+11x+6}}$

Answers:

a. $\dfrac{x-7}{2(x+7)}$, $x\neq\dfrac{4}{3},-3,0,\dfrac{1}{4},-7,2$

b. $\dfrac{x+2}{x-5}$, $x\neq\pm3,-2,\dfrac{5}{2},\pm5$

c. $\dfrac{x+3}{x-3}$, $x\neq\pm3,\pm1,-4,\dfrac{2}{3}$

d. $-\dfrac{m+8}{m+2}$, $m\neq\pm4,-7,-2,-\dfrac{1}{3},-8,\dfrac{3}{2}$

e. -1 , $x\neq\pm\dfrac{3}{4},-2$