02/25 HW p.112 2, 3, 4a, c, e, 5, 6, 8, 10

Ans. to 5a, b are incorrect!

2. a) $\frac{5(\cancel{x+3})}{(\cancel{x+3})(x-3)} = \frac{5}{x-3}$ $x \neq \pm 3$

b) $\frac{6x-9}{2x-3} = \frac{3(\cancel{2x-3})}{\cancel{2x-3}} = 3$ $x \neq \frac{3}{2}$

c) $\frac{4a^2b-2ab^2}{(2a-b)^2} = \frac{2ab(\cancel{2a-b})}{(2a-b)^{\cancel{2}}} = \frac{2ab}{2a-b}$ $a \neq \frac{b}{2}$

$2a-b \neq 0$
$2a \neq b$
$a \neq \frac{b}{2}$

3. a) $\frac{(\cancel{x-1})(x-3)}{(x+2)(\cancel{x-1})} = \frac{x-3}{x+2}$ $x \neq -2, 1$

b) $\frac{5x^2+x-4}{25x^2-40x+16} = \frac{(\cancel{5x-4})(x+1)}{(5x-4)^{\cancel{2}}} = \frac{x+1}{5x-4}$ $x \neq \frac{4}{5}$

c) $\frac{x^2-7xy+10y^2}{x^2+xy-6y^2} = \frac{(\cancel{x-2y})(x-5y)}{(\cancel{x-2y})(x+3y)} = \frac{x-5y}{x+3y}$ $x \neq 2y, -3y$

4. a) $\frac{14x^3-7x^2+21x}{7x} = \frac{\cancel{7x}(2x^2-x+3)}{\cancel{7x}} = 2x^2-x+3$ $x \neq 0$

c) $\frac{2\cancel{t}(5-t)}{5t^{\cancel{2}}(t-5)} = \frac{-2(\cancel{t-5})}{5t(\cancel{t-5})} = \frac{-2}{5t}$ $t \neq 0, 5$

e) $\frac{2x^2+10x}{-3x-15} = \frac{2x(\cancel{x+5})}{-3(\cancel{x+5})} = -\frac{2x}{3}$ $x \neq -5$

5. a) $\frac{a+4}{a^2+3a-4} = \frac{\cancel{a+4}}{(\cancel{a+4})(a-1)} = \frac{1}{a-1}$ $a \neq -4, 1$

Text incorrect It says $\frac{1}{a}-1$

b) $\frac{x^2-9}{15-5x} = \frac{(x+3)(x-3)}{-(5x-15)} = \frac{(x+3)(\cancel{x-3})}{-5(\cancel{x-3})} = -\frac{x+3}{5}$ $x \neq 3$

Text incorrect It says $-x-\frac{3}{5}$

c) $\frac{x^2-5x+6}{x^2+3x-10} = \frac{(x-3)(\cancel{x-2})}{(x+5)(\cancel{x-2})} = \frac{x-3}{x+5}$ $x \neq 2, -5$

5. d) $\dfrac{10+3p-p^2}{25-p^2}$

$= \dfrac{\cancel{(5-p)}(2+p)}{\cancel{(5-p)}(5+p)}$

$= \dfrac{2+p}{5+p}$ or $\dfrac{p+2}{p+5}$

$p \neq 5, -5$

e) $\dfrac{t^2-7t+12}{t^3-6t^2+9t}$

$= \dfrac{(t-4)(t-3)}{t(t^2-6t+9)}$

$= \dfrac{(t-4)\cancel{(t-3)}}{t(t-3)^{\cancel{2}}}$

$= \dfrac{t-4}{t(t-3)}$

$t \neq 0, 3$

f) $\dfrac{6t^2-t-2}{2t^2-t-1}$

$= \dfrac{6t^2+3t-4t-2}{(2t+1)(t-1)}$

$= \dfrac{3t(2t+1)-2(2t+1)}{(2t+1)(t-1)}$

$= \dfrac{(3t-2)\cancel{(2t+1)}}{\cancel{(2t+1)}(t-1)}$

$= \dfrac{3t-2}{t-1}$ $\quad t \neq -\frac{1}{2}, 1$

6. a) $f(x) = \dfrac{2+x}{x}$

$D: \{x \in R \mid x \neq 0\}$

b) $g(x) = \dfrac{3}{x(x-2)}$

$D: \{x \in R \mid x \neq 0, 2\}$

c) $h(x) = \dfrac{-3}{(x+5)(x-5)}$

$D: \{x \in R \mid x \neq \pm 5\}$

Restrictions determine the domain in *every case*.

d) $f(x) = \dfrac{1}{x^2-1}$

$= \dfrac{1}{(x+1)(x-1)}$

$D: \{x \in R \mid x \neq \pm 1\}$

e) $g(x) = \dfrac{1}{x^2+1}$

No restrictions

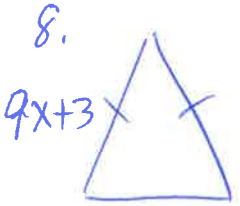
$D: \{x \in R\}$

f) $h(x) = \dfrac{\cancel{x-1}}{(x+1)\cancel{(x-1)}}$

$= \dfrac{1}{x+1}$

$D: \{x \in R \mid x \neq \pm 1\}$

8.



$P = 30x+10$

a) (i) $30x+10 = 2(9x+3)+B$

$30x+10 = 18x+6+B$

$\boxed{B = 12x+4}$

(ii) Ratio of base to perimeter $= \dfrac{12x+4}{30x+10}$

$= \dfrac{\cancel{4}^{2}\cancel{(3x+1)}}{\cancel{10}_{5}\cancel{(3x+1)}}$

$= \dfrac{2}{5}$ $\quad x > -\frac{1}{3}$

b) The restriction on x is necessary b/c when $x \leq -\frac{1}{3}$, the side lengths would be zero or neg. values, so there would be no triangle.

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10. a) $\dfrac{20t^3+15t^2-5t}{5t}$

$= \dfrac{\cancel{5t}(4t^2+3t-1)}{\cancel{5t}}$

$= (4t-1)(t+1)$

$t \neq 0$

b) $\dfrac{5(4x-2)}{8(2x-1)^2}$

$= \dfrac{{}^{5}\cancel{10}(2\cancel{x}-1)}{{}_{4}\cancel{8}(2x-1)^{\cancel{2}}}$

$= \dfrac{5}{4(2x-1)}$

$x \neq \frac{1}{2}$

c) $\dfrac{x^2-9x+20}{16-x^2}$

$= \dfrac{(x-5)(x-4)}{-(x^2-16)}$

$= \dfrac{(x-5)\cancel{(x-4)}}{-(x+4)\cancel{(x-4)}}$

$= -\dfrac{(x-5)}{(x+4)}$

$x \neq 4, -4$

d) $\dfrac{2x^2-xy-y^2}{x^2-2xy+y^2}$

$= \dfrac{(2x+y)\cancel{(x-y)}}{(x-y)^{\cancel{2}}}$

$= \dfrac{2x+y}{x-y}$

$x \neq y$