MC

1. A
2. C
3. C
4. B
5. B
6. B
7. A

Short Answer

1. *Simplify each expression and state any non-permissible values.*

a. $\frac{x^2-2x}{x+1} \times \frac{x^2-1}{x^2+x-6}$

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

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

b. $\frac{4x-1}{x^2+7x+12} \div \frac{2x-1}{x^2+x-12}$

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

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

$\frac{(4x-1)(x-3)}{(x+3)(2x-1)}$ $x \neq -3, -4, \frac{1}{2}, 3$

c. $\frac{2x^2+x-1}{6x^2-x-2} \times \frac{2x^2+3x+1}{2x^2+5x-3} \div \frac{x^2+2x+1}{x+3}$

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

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

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

2. *Simplify each expression and state any non-permissible values.*

a. $\frac{x}{x^2-3x-4} - \frac{4}{x+1}$

$\frac{x}{(x-4)(x+1)} - \frac{4}{(x+1)}$

$\frac{x-4(x-4)}{(x-4)(x+1)}$

$\frac{x-4x+16}{(x-4)(x+1)}$

$\frac{-3x+16}{(x-4)(x+1)}$

$x \neq 4, -1$

b. $\frac{3x+1}{2x^2-2} + \frac{2x+2}{2x^2-8x+6}$

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

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

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

$x \neq 1, -1, 3$

$\frac{(3x^2-8x-3)+2(x^2+2x+1)}{2(x-1)(x+1)(x-3)}$

$\frac{3x^2-8x-3+2x^2+4x+2}{2(x-1)(x+1)(x-3)} \Rightarrow \frac{5x^2-4x-1}{2(x-1)(x+1)(x-3)}$

c. $\frac{5}{x^2-1} - \frac{2}{x^2+4x+3} + \frac{3}{x^2+2x-3}$

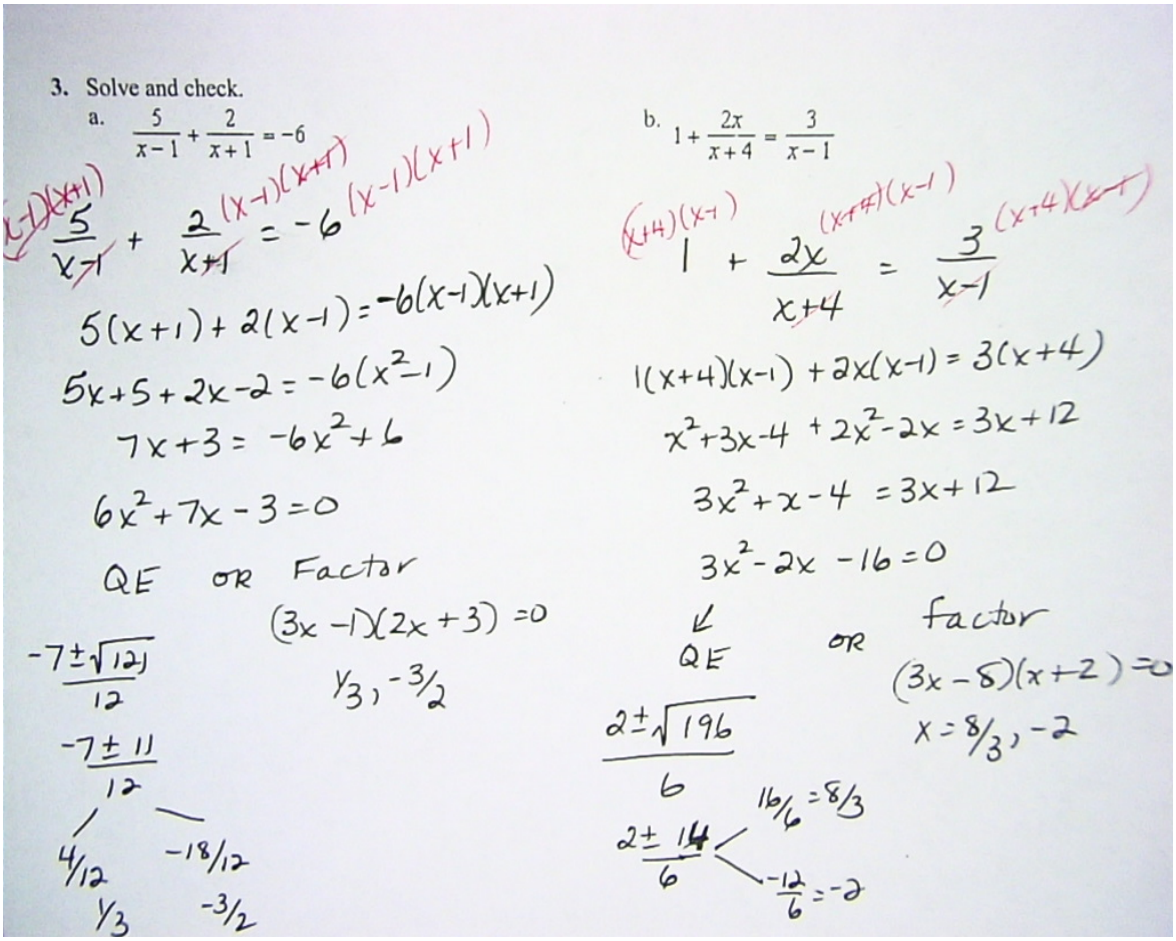
$\frac{5}{(x-1)(x+1)} - \frac{2}{(x+3)(x+1)} + \frac{3}{(x+3)(x-1)}$

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

$\frac{5x+15-2x+2+3x+3}{(x-1)(x+1)(x-3)}$

$\frac{6x+20}{(x-1)(x+1)(x-3)}$

$x \neq 1, -1, 3$



3. Solve and check.

a. $\frac{5}{x-1}+\frac{2}{x+1}=-6$

$\frac{5}{x-1}+\frac{2}{x+1}=-6$ $(x-1)(x+1)$

$5(x+1)+2(x-1)=-6(x-1)(x+1)$

$5x+5+2x-2=-6(x^2-1)$

$7x+3=-6x^2+6$

$6x^2+7x-3=0$

QE OR Factor

$(3x-1)(2x+3)=0$

$1/3, -3/2$

$\frac{-7\pm\sqrt{121}}{12}$

$\frac{-7\pm 11}{12}$

$4/12 \quad -18/12$

$1/3 \quad -3/2$

b. $1+\frac{2x}{x+4}=\frac{3}{x-1}$

$(x+4)(x-1)$

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

$1(x+4)(x-1)+2x(x-1)=3(x+4)$

$x^2+3x-4+2x^2-2x=3x+12$

$3x^2+x-4=3x+12$

$3x^2-2x-16=0$

QE OR factor

$(3x-8)(x+2)=0$

$x=8/3, -2$

$\frac{2\pm\sqrt{196}}{6}$

$\frac{2\pm 14}{6}$

$16/6=8/3$

$-12/6=-2$

1. $\frac{3}{x+2} + \frac{3}{x+2} + \frac{2}{x-3} + \frac{2}{x-3} = 5$

$3(x-3) + 3(x-3) + 2(x+2) + 2(x+2) = 5(x+2)(x-3)$

$3x-9+3x-9+2x+4+2x+4 = 5(x^2-x-6)$

$10x-10 = 5x^2-5x-30$

$0 = 5x^2-15x-20$

$0 = 5(x^2-3x-4)$

$5(x-4)(x+3)$

$x = 4$ or -3 ← inadmissible

2.

	D	S	T
Ed → Van	1200	$x-5$	$\frac{1200}{x-5}$
Van → Ed	1200	x	$\frac{1200}{x}$
			31

75 km/h going
80 km/h return

$\frac{1200}{x-5} + \frac{1200}{x} = 31$

$1200x + 1200(x-5) = 31x(x-5)$

$1200x + 1200x - 6000 = 31x^2 - 155x$

$0 = 31x^2 - 2555x + 6000$

$\frac{2555 \pm \sqrt{5784025}}{62}$

$\frac{2555 \pm 2405}{62}$ < 80, 2.42...

3. x

$x-12$

16, 4

2.4, -9.6

$16x(x-12)$ $16x(x-12)$ $16x(x-12)$

$\frac{1}{x} + \frac{1}{x-12} = \frac{5}{16}$

$16(x-12) + 16x = 5x(x-12)$

$16x - 192 + 16x = 5x^2 - 60x$

$0 = 5x^2 - 92x + 192$

$\frac{92 \pm \sqrt{4624}}{10}$

$\frac{92 \pm 68}{10}$ < 16, 2.4

4. $\frac{10x^2+3x-1}{5x-1}$

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

$w = 2x+1$

b) $2(5)+1$

$= 11m$