HW is Ex4c, 1a, 2a, 3a, 4a

Q1a)

Express $\frac{8x+4}{(1-x)(2+x)}$ as partial fractions

$\frac{8x+4}{(1-x)(2+x)} \equiv \frac{A}{1-x} + \frac{B}{2+x}$

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

$8x + 4 \equiv A(2 + x) + B(1 - x)$

substitute x = -2

$-16 + 4 \equiv A \times 0 + B \times 3$

$-12 = 3B$

$B = -4$

Substitute x = 1

$8 + 4 = A \times 3 + B \times 0$

$12 = 3A$

$A = 4$

therefore $\frac{8x+4}{(1-x)(2+x)} = \frac{4}{1-x} - \frac{4}{2+x}$

Q2a)

Express $-\frac{2x}{(2+x)^2}$ as partial fractions

$-\frac{2x}{(2+x)^2} \equiv \frac{A}{2+x} + \frac{B}{(2+x)^2}$

$\frac{A(2+x)+B(2+x)}{(2+x)(2+x)^2}$

$2x \equiv A(2 + x) + B(2 + x)^2$

$2x \equiv A(2 + x) + B(x^2 + 4x + 4)$

substitute x = -2

$4 = A \times 0 + B \times 0$

REMINDER: ask miss about how to do this one, why does it give me 4 = 0

Q3a)

Express $\frac{6+7x+5x^2}{(1+x)(1-x)(2+x)}$ as partial fractions

$\frac{6+7x+5x^2}{(1+x)(1-x)(2+x)} \equiv \frac{A}{1+x} + \frac{B}{1-x} + \frac{C}{2+x}$

$\frac{A(1-x)(2+x)+B(1+x)(2+x)+C(1-x)(1+x)}{(1+x)(1-x)(2+x)}$

$6 + 7x + 5x^2 \equiv A(1-x)(2+x) + B(1+x)(2+x) + C(1-x)(1+x)$

sub x = -1

$A(1--1)(2-1) + B(1+-1)(2-1) + C(1--1)(1-1)$

$6 - 7 + 5 = A(2) + B(0) + C(0)$

$2A = 4$

$A = 2$

sub x = 1

$A(1-1)(2+1) + B(1+1)(2+1) + C(1-1)(1+1)$

$6 + 7 + 5 = 6B$

$B = 3$

sub x = -2

$A(1--2)(2-2) + B(1-2)(2-2) + C(1+2)(1-2)$

\$ 6-14+20 = -3C\$

$C = -4$

Therefore $\frac{6+7x+5x^2}{(1+x)(1-x)(2+x)} \equiv \frac{2}{1+x} + \frac{3}{1-x} - \frac{4}{2+x}$

Q4a)

Express $\frac{12x-1}{(1+2x)(1-3x)}$ as a partial fraction

$\frac{12x-1}{(1+2x)(1-3x)}$

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

$12x - 1 \equiv A(1-3x) + B(1+2x)$

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

$12(-\frac{1}{2}) - 1 \equiv A(1 - 3(-\frac{1}{2})) + B(1 + 2(-\frac{1}{2}))$

$-7 = \frac{5}{2}A + B(0)$

$A = \frac{-14}{5}$

sub x = $\frac{1}{3}$

$12(\frac{1}{3}) - 1 = A(1 - 3(\frac{1}{3})) + B(1 + 2(\frac{1}{3}))$

$3 = \frac{5}{3}B$

$B = \frac{9}{5}$