P484 8a

$$\frac{4}{x+1} + \frac{5}{x+2} = 2$$

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

$$4x + 8 + 5x + 5 = 2(x^2 + x + 2x + 2)$$

$+3x$

$$9x + 13 = 2x^2 + 6x + 4$$

$$0 = 2x^2 + 6x + 4 - 9x - 13$$

$$0 = 2x^2 - 3x - 9$$

$2x - 9$
$= -18$

$+1 \quad -18$
$-1 \quad +18$
$+2 \quad -9$
$-2 \quad +9$
$+3 \quad -6$ ✓
$-3 \quad +6$

$$0 = 2x^2 + 3x - 6x - 9$$

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

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

Either $x - 3 = 0$ or $2x + 3 = 0$

$x = 3$

$2x = -3$

$x = -\frac{3}{2}$

9a) $$\frac{x^2+2x-3}{2x^2+7x+3} = \frac{\cancel{(x+3)}(x-1)}{\cancel{(x+3)}(2x+1)}$$

2×3
$= 6$
$+1 \quad +6$

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

$2x^2 + x + 6x + 3$

$x(2x+1) + 3(2x+1)$

$(x+3)(2x+1)$

9b $$\frac{18}{4x-1} - \frac{1}{x+1} = 1$$

$$\frac{18\cancel{(4x-1)}(x+1)}{\cancel{(4x-1)}} - \frac{1(4x-1)\cancel{(x+1)}}{\cancel{(x+1)}} = 1(4x-1)(x+1)$$

$$18x + 18 - 4x + 1 = 4x^2 - x + 4x - 1$$

$$14x + 19 = 4x^2 + 3x - 1$$

$$0 = 4x^2 + 3x - 1 - 14x - 19$$

$$0 = 4x^2 - 11x - 20$$

$4x - 20$
$= -80$
$-16 + 5$

$$0 = 4x^2 - 16x + 5x - 20$$

$$0 = 4x(x-4) + 5(x-4)$$

$$0 = (4x+5)(x-4)$$

Either $4x + 5 = 0$
$4x = -5$
$x = -5/4$

or $x - 4 = 0$
$x = 4$

8c $\dfrac{2x-1}{2} - \dfrac{6}{x+1} = 1$

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

$$2x^2 - x + 2x - 1 - 12 = 2x + 2$$

$$2x^2 - x + 2x - 1 - 12 - 2x - 2 = 0$$

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

2×-15
$= -30$
$-6 + 5$

$$2x^2 - 6x + 5x - 15 = 0$$

$$2x(x-3) + 5(x-3) = 0$$

$$(2x+5)(x-3) = 0$$

Either $2x + 5 = 0$
$2x = -5$
$x = -\frac{5}{2}$

or $x - 3 = 0$
$x = 3$