

HW 4c.1 #1e, 2dk, 3jkl, 4cefh

1e.) $9x = 6x^2 \Rightarrow 0 = 6x^2 - 9x$
 $\Rightarrow 0 = 3x(2x-3)$
 $\therefore 3x=0 \quad 2x-3=0$
 $\boxed{x=0} \quad \boxed{x=\frac{3}{2}}$

3l.) $15x^2 + 2x = 56$ ~~$\frac{-840}{2}$~~
 $15x^2 + 2x - 56 = 0$
 $(15x^2 - 28x) + (30x - 56) = 0$
 $x(15x-28) + 2(15x-28) = 0$
 $(x+2)(15x-28) = 0$
 $\boxed{x=-2} \quad \boxed{x=\frac{28}{15}}$

2d.) $x^2 + 7x + 12 = 0$
 $(x+4)(x+3) = 0$
 $\boxed{x=-4} \quad \boxed{x=-3}$

~~$\frac{12}{4 \times 3}$~~
 ~~$\frac{7}{7}$~~

2k.) $4x = 70 - 2x^2$
 $-70 + 2x^2 - 70 + 2x^2$
 $\Rightarrow 2x^2 + 4x - 70 = 0$
 $2(x^2 + 2x - 35) = 0$
 $2(x+7)(x-5) = 0$
 $\boxed{x=-7} \quad \boxed{x=5}$

~~$\frac{-35}{7 \times 2}$~~
 ~~$\frac{-5}{-5}$~~

4c.) $5 - 4x^2 = 3(2x+1) + 2$
 $5 - 4x^2 = 6x + 3 + 2$
 $-5 + 4x^2 - 4x^2 - 5$
 $0 = 4x^2 + 6x$
 $2x(2x+3) = 0$
 $\boxed{x=0} \quad \boxed{x=-\frac{3}{2}}$

3j.) $12x^2 = 11x + 15$
 $12x^2 - 11x - 15 = 0$
 $(12x^2 - 20x) + (9x - 15) = 0$
 $4x(3x-5) + 3(3x-5) = 0$
 $(4x+3)(3x-5) = 0$
 $\therefore \boxed{x=-\frac{3}{4}} \quad \boxed{x=\frac{5}{3}}$

~~$\frac{180}{-20 \times 9}$~~
 ~~$\frac{-11}{-11}$~~

4e.) $2x - \frac{1}{x} = -1$ (multiply by x)
 $\Rightarrow 2x^2 - 1 = -x$
 $\Rightarrow 2x^2 + x - 1 = 0$
 $(2x^2 + 2x)(-x-1) = 0$
 $2x(x+1) - 1(x+1) = 0$
 $(2x-1)(x+1) = 0$
 $\therefore \boxed{x=\frac{1}{2}} \quad \boxed{x=-1}$

~~$\frac{-2}{2 \times 1}$~~
 ~~$\frac{-1}{-1}$~~

3k.) $7x^2 + 6x = 1$
 $7x^2 + 6x - 1 = 0$
 $(7x^2 + 7x)(x-1) = 0$
 $7x(x+1) - 1(x+1) = 0$
 $(7x-1)(x+1) = 0$
 $\boxed{x=\frac{1}{7}} \quad \boxed{x=-1}$

~~$\frac{-7}{7 \times 6}$~~
 ~~$\frac{-1}{-1}$~~

4f.) $\frac{x+3}{1-x} = \frac{-9}{x}$ (cross multiply)
 $\Rightarrow x^2 + 3x = -9 + 9x$
 $\Rightarrow x^2 - 6x + 9 = 0$
 $(x-3)^2 = 0$
 $\therefore \boxed{x=3}$

~~$\frac{9}{-3 \times -3}$~~
 ~~$\frac{-6}{-6}$~~

$$4h.) (x-4)(x+2) = 16$$

$$x^2 + 2x - 4x - 8 = 16$$

$$x^2 - 2x - 8 = 16$$

$$-16 \quad -16$$

$$x^2 - 2x - 24 = 0$$

$$(x-6)(x+4) = 0$$

$$\boxed{x=6}, \boxed{x=-4}$$

$$\begin{array}{r} -24 \\ -6 \quad 4 \\ -2 \end{array}$$