HW HL 4C.2 #1eh, 2bc, 3b, 4 SL 4D.2 same

1e.) $x^2+6x+7=0$

$-7 \quad -7$

$x^2+6x+3^2 = -7+9$

$(\frac{6}{2})^2 = 3^2$

$\sqrt{(x+3)^2} = \sqrt{2}$

$x+3 = \pm\sqrt{2}$

$\boxed{x = -3 \pm \sqrt{2}}$

1h.) $x^2+10 = 8x$

$-8x \quad -10 \quad -8x \quad -10$

$x^2-8x+(-4)^2 = -10+16$

$(\frac{-8}{2})^2 = (-4)^2$

$\sqrt{(x-4)^2} = \sqrt{6}$

$x-4 = \pm\sqrt{6}$

$\boxed{x = 4 \pm \sqrt{6}}$

2b.) $2x^2-10x+3=0$

$x^2-5x+\frac{3}{2}=0$

$x^2-5x+(-5/2)^2 = -\frac{3}{2}+25/4$

$(\frac{-5}{2})^2$

$\sqrt{(x-\frac{5}{2})^2} = \sqrt{\frac{19}{4}}$

$x-5 = \pm\frac{\sqrt{19}}{2}$

$\boxed{x = 5 \pm \frac{\sqrt{19}}{2}}$

2c.) $3x^2+12x+5=0$

$x^2+4x+\frac{5}{3}=0$

$x^2+4x+(2)^2 = -\frac{5}{3}+4$

$(\frac{4}{2})^2 = (2)^2$

$\sqrt{(x+2)^2} = \sqrt{\frac{7}{3}}$

$x+2 = \pm\sqrt{\frac{7}{3}}$

$\boxed{x = -2 \pm \sqrt{\frac{7}{3}}}$

3b.) $\left(1-\frac{1}{x} = -5x\right)(x)$

$x-1 = -5x^2$

$+5x^2 \quad +5x^2$

$5x^2+x-1=0$

$x^2+\frac{1}{5}x+(\frac{1}{10})^2 = 1+1/100$

$(\frac{1}{5}\cdot\frac{1}{2})^2 = (\frac{1}{10})^2$

$\sqrt{(x+1/10)^2} = \sqrt{101/100}$

$x+1/10 = \pm\frac{\sqrt{101}}{10}$

$\boxed{x = \frac{-1}{10} \pm \frac{\sqrt{101}}{10}}$

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4.) $ax^2 + bx + c = 0$

$x^2 + \frac{b}{a}x + \frac{c}{a} = 0$

$x^2 + \frac{b}{a}x + (b/2a)^2 = -\frac{c}{a} + (b/2a)^2$

$(b/a \cdot 1/2)^2 = (b/2a)^2$

$(x + \frac{b}{2a})^2 = -\frac{c}{a} + \frac{b^2}{4a^2} \Rightarrow -\frac{4ac}{4a^2} + \frac{b^2}{4a^2} \Rightarrow \frac{b^2-4ac}{4a^2}$

$\Rightarrow \sqrt{(x + \frac{b}{2a})^2} = \sqrt{\frac{b^2-4ac}{4a^2}}$

$x + \frac{b}{2a} = \pm \frac{\sqrt{b^2-4ac}}{2a}$

$-\frac{b}{2a} \quad -\frac{b}{2a}$

$\boxed{x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}}$ ☺ should look familiar

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