

# HW 02

p304

30. P.Z. =  $\pm 0$

$$\begin{array}{r|rrrrr} 01 & 1 & 0 & -13 & -12 & 0 \\ & \downarrow & 0 & 0 & 0 & 0 & \checkmark \\ \hline & 1 & 0 & -13 & -12 & 0 \end{array}$$

$$x^3 - 13x - 12 = 0$$

$$\text{P.Z.} = \pm 1, \pm 2, \pm 3, \pm 4, \pm 6, \pm 12$$

$$\begin{array}{r|rrrr} -11 & 1 & 0 & -13 & -12 \\ & \downarrow & -1 & 1 & 12 \\ \hline & 1 & -1 & -12 & 0 \end{array}$$

$$x^2 - x - 12$$

$$(x-4)(x+3)(x+1)(x) = 0$$

$$\boxed{x = 4, -3, -1, 0}$$

$$31. \frac{\pm 1, \pm 2, \pm 4}{\pm 1, \pm 2} = \pm 1, \pm 2, \pm 4, \pm \frac{1}{2}$$

$$\begin{array}{r|rrrrr} \frac{1}{2} & 2 & 3 & -16 & 15 & -4 \\ & \downarrow & 1 & 2 & -7 & 4 \\ \hline & 2 & 4 & -14 & 8 & 0 \checkmark \end{array} \quad x = \frac{1}{2}$$

$$\begin{array}{r|rrrr} -4 & 2 & 4 & -14 & 8 \\ & \downarrow & -8 & 8 & -8 \\ \hline & 2 & -4 & 2 & 0 \end{array} \quad x = -4$$

$$\boxed{x = \frac{1}{2}, -4, 1}$$

$$\begin{aligned} & 2x^2 - 4x + 2 \\ & 2(x^2 - 2x + 1) \\ & 2(x-1)(x-1) \end{aligned}$$

$$x = 1$$

$$37. a) \frac{\pm 1, \pm 2, \pm 4, \pm 8}{\pm 1, \pm 2} = \pm 1, \pm 2, \pm 4, \pm 8, \pm \frac{1}{2}$$

b) from graph  $x=1$

$$\begin{array}{r|rrrr} 1 & -2 & 13 & -21 & 2 & 8 \\ & \downarrow & -2 & 11 & -10 & -8 \\ \hline & -2 & 11 & -10 & -8 & \boxed{0} \end{array} \quad \checkmark$$

$$\begin{array}{r|rrrr} 2 & -2 & 11 & -10 & -8 \\ & \downarrow & -4 & 14 & 8 \\ \hline & -2 & 7 & 4 & \boxed{0} \end{array}$$

$$\begin{aligned} & -2x^2 + 7x + 4 \\ & (-2x - 1)(x - 4) \end{aligned}$$

$$\boxed{x=1, x=2, x=4, x=-\frac{1}{2}}$$

41. P. Z =  $\pm 1, \pm 2$

$$\begin{array}{r|rrrr} 1 & 1 & 0 & -3 & 2 \\ & \downarrow & 1 & 1 & -2 \\ \hline & 1 & 1 & -2 & \boxed{0} \end{array}$$

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

$$\boxed{(x-1)^2(x+2)}$$