

$$13) v^2 - 6v = -91$$

$$v^2 - 6v + 9 = -91 + 9$$

$$\sqrt{(v-3)^2} = \sqrt{-82}$$

$$v-3 = \pm i\sqrt{82}$$

$$+3 \quad +3$$

$$\boxed{v = 3 \pm i\sqrt{82}}$$

$$14) n^2 - 18n + 81 = 40 + 81$$

$$\sqrt{(n-9)^2} = \sqrt{121}$$

$$n-9 = \pm 11$$

$$+9 \quad +9$$

$$n = 9 \pm 11 \quad \boxed{\begin{matrix} n=20 \\ n=-2 \end{matrix}}$$

$$15) 5k^2 = 60 - 20k$$

$$\frac{5k^2}{5} + \frac{20k}{5} = \frac{60}{5}$$

$$k^2 + 4k + 4 = 12 + 4$$

$$\sqrt{(k+2)^2} = \sqrt{16}$$

$$k+2 = \pm 4$$

$$k = -2 \pm 4 \quad \boxed{\begin{matrix} k=-6 \\ k=2 \end{matrix}}$$

$$16) \frac{6x^2}{6} - \frac{48}{6} = \frac{-12x}{6}$$

$$x^2 + 2x + 1 = 8 + 1$$

$$\sqrt{(x+1)^2} = \sqrt{9}$$

$$x+1 = \pm 3$$

$$-1 \quad -1$$

$$x = -1 \pm 3 \quad \boxed{\begin{matrix} x=-4 \\ x=2 \end{matrix}}$$

$$17) \frac{8x^2}{8} + \frac{16x}{8} = \frac{42}{8}$$

$$x^2 + 2x + 1 = \frac{21}{4} + \frac{1 \cdot 4}{1 \cdot 4}$$

$$\sqrt{(x+1)^2} = \sqrt{\frac{25}{4}}$$

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

$$-1 \quad -1$$

$$x = -1 \pm \frac{5}{2}$$

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

$$x = -\frac{7}{2}$$

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

$$18) \frac{9n^2}{9} + \frac{18n}{9} = \frac{-79}{9}$$

$$n^2 + 2n = \frac{-79}{9}$$

$$n^2 + 2n + 1 = \frac{-79}{9} + \frac{1 \cdot 9}{1 \cdot 9}$$

$$\sqrt{(n+1)^2} = \sqrt{\frac{-70}{9}}$$

$$n+1 = \pm i \frac{\sqrt{70}}{3}$$

$$n = -1 \pm i \frac{\sqrt{70}}{3}$$

$$19) \frac{2a^2}{2} = -\frac{6}{2} + \frac{89}{2}$$

$$a^2 + 4a + 4 = -3 + 4$$

$$\sqrt{(a+2)^2} = \sqrt{1}$$

$$a+2 = \pm 1$$

$$+2 \quad +2$$

$$a = 2 \pm 1$$

$$\boxed{a=3 \quad a=1}$$

$$20) \frac{2x^2}{2} - \frac{5x}{2} + \frac{67}{2} = 0 \quad \left(\frac{5}{2}\right) \cdot \frac{1}{2} = \left(\frac{5}{4}\right)^2$$

$$x^2 - \frac{5}{2}x + \frac{67}{2} = -\frac{67}{2} + \frac{25}{8}$$

$$\sqrt{\left(x - \frac{5}{4}\right)^2} = \sqrt{\frac{-511}{16}}$$

$$\boxed{x = \frac{5}{4} \pm \frac{i\sqrt{511}}{6}}$$

$$21) \frac{4n^2}{4} + \frac{4n}{4} + \frac{36}{4} = 0$$

$$n^2 + n + 9 = -\frac{9}{1 \cdot 4} + \frac{1}{4}$$

$$\sqrt{\left(n + \frac{1}{2}\right)^2} = \sqrt{\frac{-35}{4}}$$

$$\boxed{n = -\frac{1}{2} \pm \frac{i\sqrt{35}}{2}}$$

$$22) \frac{7k^2}{7} - \frac{16k}{7} + \frac{100}{7} = 0$$

$$k^2 - \frac{16k}{7} + \frac{256}{49} = -\frac{100}{7} + \frac{256}{49}$$

$$\left(\frac{16}{7} \cdot \frac{1}{2}\right)^2 = \left(\frac{16}{14}\right)^2$$

$$23) 10p^2 + 4p + 77 = 9$$

$$-77 \quad -77$$

$$\frac{10p^2}{10} + \frac{4p}{10} = \frac{-68}{10}$$

$$p^2 + \frac{2}{5}p + \frac{4}{10} = \frac{-68 \cdot 10}{10 \cdot 10} + \frac{4}{10}$$

$$\sqrt{\left(k - \frac{16}{14}\right)^2} = \sqrt{\frac{-2544}{196}}$$

$$\left(\frac{2}{5} \cdot \frac{1}{2}\right)^2 = \left(\frac{2}{10}\right)^2 = \frac{4}{100}$$

$$\sqrt{\left(p + \frac{2}{10}\right)^2} = \sqrt{\frac{-676}{100}}$$

$$k - \frac{16}{14} = \pm \frac{i\sqrt{2544}}{14}$$

$$k = \frac{16}{14} \pm \frac{4i\sqrt{159}}{14}$$

$$p + \frac{2}{10} = \pm \frac{26i}{10}$$

$$p = \frac{2}{10} \pm \frac{26i}{10}$$

$$k = \frac{8}{7} \pm \frac{2i\sqrt{159}}{7}$$

$$\boxed{p = \frac{1}{5} \pm \frac{13i}{5}}$$