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33-43 odd

47-55 odd

$$(33) \quad x^2 - 2x = 99$$

-99    -99

$$x^2 - 2x - 99 = 0$$

$a=1 \quad b=-2 \quad c=-99$

$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(-99)}}{2(1)}$$

$$x = \frac{2 \pm \sqrt{4 - (-396)}}{2}$$

$$x = \frac{2 \pm \sqrt{400}}{2}$$

$$x = \frac{2 \pm 20}{2}$$

$$x = \frac{2}{2} \pm \frac{20}{2}$$

$$x = 1 \pm 10$$

$$x = 11 \quad \text{or} \quad x = -9$$

$$(35) \quad x^2 = 8x - 35$$

$$-8x + 35 - 8x + 35$$

$$x^2 - 8x + 35 = 0$$

$$a=1 \quad b=-8 \quad c=35$$

$$x = \frac{-(-8) \pm \sqrt{(-8)^2 - 4(1)(35)}}{2(1)}$$

$$x = \frac{8 \pm \sqrt{64 - 140}}{2}$$

$$x = \frac{8 \pm \sqrt{-76}}{2}$$

$$x = \frac{8 \pm \sqrt{4} \sqrt{19} \sqrt{-1}}{2}$$

$$x = \frac{8 \pm 2\sqrt{19}i}{2}$$

$$x = \frac{8}{2} \pm \frac{2\sqrt{19}i}{2}$$

$$x = 4 + \sqrt{19}i \quad \text{or} \quad x = 4 - \sqrt{19}i$$

$$\textcircled{37} \quad \begin{array}{r} -x^2 \\ +x^2 \end{array} = \begin{array}{r} 16x \\ +x^2 \end{array} + 46$$

$$x^2 + 16x + 46 = 0$$

$$a=1 \quad b=16 \quad c=46$$

$$x = \frac{-16 \pm \sqrt{(16)^2 - 4(1)(46)}}{2(1)}$$

$$x = \frac{-16 \pm \sqrt{256 - 184}}{2}$$

$$x = \frac{-16 \pm \sqrt{72}}{2}$$

$$x = \frac{-16 \pm \sqrt{36} \cdot \sqrt{2}}{2}$$

$$x = \frac{-16 \pm 6\sqrt{2}}{2}$$

$$x = \frac{-16}{2} \pm \frac{6\sqrt{2}}{2}$$

$$x = -8 + 3\sqrt{2} \quad \text{or} \quad x = -8 - 3\sqrt{2}$$

$$\textcircled{39} \quad 8x^2 - 8x = 1$$

$$8x^2 - 8x - 1 = 0$$

$a=8 \quad b=-8 \quad c=-1$

$$x = \frac{-(-8) \pm \sqrt{(-8)^2 - 4(8)(-1)}}{2(8)}$$

$$x = \frac{8 \pm \sqrt{64 - 32}}{16}$$

$$x = \frac{8 \pm \sqrt{96}}{16}$$

$$x = \frac{8 \pm \sqrt{16} \sqrt{6}}{16}$$

$$x = \frac{8 \pm 4\sqrt{6}}{16}$$

$$x = \frac{8}{16} \pm \frac{4\sqrt{6}}{16}$$

$$x = \frac{1}{2} + \frac{\sqrt{6}}{4} \quad \text{or} \quad x = \frac{1}{2} - \frac{\sqrt{6}}{4}$$

$$x = \frac{2 + \sqrt{6}}{4} \quad \text{or} \quad x = \frac{2 - \sqrt{6}}{4}$$

$$(41) \quad \begin{array}{r} 40x - 7x^2 \\ -40x + 7x^2 \end{array} = \begin{array}{r} 101 - 3x^2 \\ -40x + 7x^2 \end{array}$$

$$4x^2 - 40x + 101 = 0$$

$a=4 \quad b=-40 \quad c=101$

$$x = \frac{-(-40) \pm \sqrt{(-40)^2 - 4(4)(101)}}{2(4)}$$

$$x = \frac{40 \pm \sqrt{1600 - 1616}}{8}$$

$$x = \frac{40 \pm \sqrt{-16}}{8}$$

$$x = \frac{40 \pm 4i}{8}$$

$$x = \frac{40}{8} \pm \frac{4i}{8}$$

$$x = 5 + \frac{i}{2} \quad \text{or} \quad x = 5 - \frac{i}{2}$$

$$x = \frac{10+i}{2} \quad \text{or} \quad x = \frac{10-i}{2}$$

$$\textcircled{43} \quad \begin{array}{r} 13n^2 + 11n - 9 = 4n^2 - n - 4 \\ -4n^2 + n + 4 \quad -4n^2 + n + 4 \end{array}$$

$$9n^2 + 12n - 5 = 0$$

$$a=9 \quad b=12 \quad c=-5$$

$$x = \frac{-12 \pm \sqrt{(12)^2 - 4(9)(-5)}}{2(9)}$$

$$x = \frac{-12 \pm \sqrt{144 - -180}}{18}$$

$$x = \frac{-12 \pm \sqrt{324}}{18}$$

$$x = \frac{-12 \pm 18}{18}$$

$$x = \frac{-12 + 18}{18}$$

or

$$x = \frac{-12 - 18}{18}$$

$$x = \frac{6}{18}$$

$$x = \frac{-30}{18}$$

$$x = \frac{1}{3}$$

or

$$x = -\frac{5}{3}$$

$$(47) \quad x^2 - 3x - 15 = 0$$

$$a=1 \quad b=3 \quad c=-15$$

$$x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(1)(-15)}}{2(1)}$$

$$x = \frac{3 \pm \sqrt{9 - 60}}{2}$$

$$x = \frac{3 \pm \sqrt{69}}{2}$$

$$x = \frac{3 + \sqrt{69}}{2} \quad \text{or} \quad x = \frac{3 - \sqrt{69}}{2}$$

$$(49) \quad x^2 - 18x + 32 = 0$$

$$(x - 16)(x - 2) = 0$$

$$\begin{array}{ccc} \downarrow & & \downarrow \\ x - 16 = 0 & \text{or} & x - 2 = 0 \\ +16 & +16 & +2 & +2 \end{array}$$

$$x = 16 \quad \text{or} \quad x = 2$$

$$(51) \quad 3(x+4)^2 = -27$$

$$\frac{1}{3}(3(x+4)^2) = \frac{1}{3}(-27)$$

$$(x+4)^2 = -9$$

$$\sqrt{(x+4)^2} = \pm \sqrt{-9}$$

$$x+4 = \pm \frac{3i}{-4}$$

$$\boxed{x = -4 + 3i \quad \text{or} \quad x = -4 - 3i}$$

$$(53) \quad \frac{11m^2 - 1}{-7m^2 - 2} = \frac{7m^2 + 2}{-7m^2 - 2}$$

$$\frac{4m^2 - 3}{+3} = 0$$

$$4m^2 = 3$$

$$\frac{1}{4}(4m^2) = \frac{1}{4}(3)$$

$$m^2 = \frac{3}{4}$$

$$\sqrt{m^2} = \pm \sqrt{\frac{3}{4}}$$

$$m = \pm \frac{\sqrt{3}}{\sqrt{4}}$$

$$\boxed{m = \frac{\sqrt{3}}{2} \quad \text{or} \quad m = -\frac{\sqrt{3}}{2}}$$



$$\textcircled{55} \quad \begin{array}{r} 20p^2 + 6p = 6p^2 - 13p + 3 \\ -6p^2 + 13p - 3 \quad -6p^2 + 13p - 3 \end{array}$$

$$14p^2 + 19p - 3 = 0$$

$$a=14 \quad b=19 \quad c=-3$$

$$x = \frac{-19 \pm \sqrt{(19)^2 - 4(14)(-3)}}{2(14)}$$

$$x = \frac{-19 \pm \sqrt{361 - 168}}{28}$$

$$x = \frac{-19 \pm \sqrt{529}}{28}$$

$$x = \frac{-19 \pm 23}{28}$$

$$x = \frac{-19 + 23}{28}$$

or

$$x = \frac{-19 - 23}{28}$$

$$x = \frac{4}{28}$$

$$x = \frac{-42}{28}$$

$$x = \frac{1}{7}$$

or

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