UNIT 3 DAY 1 SOLVING QUADRATIC EQUATIONS

SOLVE.

① $2x^2 - 18 = 0$

$2(x^2 - 9) = 0$

$2(x-3)(x+3) = 0$

$2 \neq 0$ | $x-3=0$ | $x+3=0$

$x=3$ | $x=-3$

② $2m^2 = -6m$ [set=0

$+6m \quad +6m$

$2m^2 + 6m = 0$

$2m(m+3) = 0$

$2m=0$ | $m+3=0$

$m=0$ | $m=-3$

③ $3x^2 = 24(x-2)$

$3x^2 = 24x - 48$ [set=0

$3x^2 - 24x + 48 = 0$

$3(x^2 - 8x + 16) = 0$

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

$x = 4, 4$

$x = 4$, double root

④ $5x^2 = 2 - 4x$

$+4x - 2 \quad -2 \quad +4x$

$5x^2 + 4x - 2 = 0$ QF

$a = 5$

$b = 4$

$c = -2$

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

$= \frac{-4 \pm \sqrt{56}}{10} \approx -1.4$

$= \frac{-4 \pm 2\sqrt{14}}{10}$

$= \frac{-2 \pm \sqrt{14}}{5}$

(5) $4m^2 + 3 = 5m$

$4m^2 - 5m + 3 = 0$

$a = 4$
$b = -5$
$c = 3$

$$m = \frac{5 \pm \sqrt{(-5)^2 - 4(4)(3)}}{2(4)}$$

$$= \frac{5 \pm \sqrt{-23}}{8} \quad \sqrt{-1} \cdot \sqrt{23} \quad = \boxed{\frac{5 \pm i\sqrt{23}}{8}}$$

$i = \sqrt{-1}$

(b) SR

$$\frac{4(2x-3)^2}{4} = \frac{-100}{4}$$

$$\sqrt{(2x-3)^2} = \sqrt{-25} \quad \pm$$

$$2x - 3 = \pm 5i$$

$+3 \quad +3$

$$\frac{2x}{2} = \frac{3 \pm 5i}{2} \Rightarrow \boxed{x = \frac{3 \pm 5i}{2}}$$

UNIT 3 DAY 1

SOLVING QUADRATIC EQUATIONS

SOLVE.

① $9x^2 = 36x - 35$

$-36x \quad +35$

QF $9x^2 - 36x + 35 = 0$ [set = 0

$a = 9$
$b = -36$
$c = 35$

$$x = \frac{36 \pm \sqrt{(-36)^2 - 4(9)(35)}}{2(9)}$$

$$= \frac{36 \pm \sqrt{36}}{18} = \frac{36 \pm 6}{18}$$

$\frac{36+6}{18} = \boxed{\frac{7}{3}}$

$\frac{36-6}{18} = \boxed{\frac{5}{3}}$

② $y^2 - 14y = 1$

$-1 \quad -1$

$y^2 - 14y - 1 = 0$ [set = 0

$a = 1$
$b = -14$
$c = -1$

$$y = \frac{14 \pm \sqrt{(-14)^2 - 4(1)(-1)}}{2(1)} = \frac{14 \pm \sqrt{200}}{2}$$

$\sqrt{200} < \begin{matrix} 100 \\ 2 \end{matrix}$

$$= \frac{14 \pm 10\sqrt{2}}{2}$$

$$= \boxed{7 \pm 5\sqrt{2}}$$

③ $x^2 = -6x - 13$

$x^2 + 6x + 13 = 0$ [set = 0

$$x = \frac{-6 \pm \sqrt{6^2 - 4(1)(13)}}{2(1)}$$

$\sqrt{-16} \rightarrow \sqrt{16}\,i$

$$= \frac{-6 \pm \sqrt{-16}}{2} = \frac{-6 \pm 4i}{2} = \boxed{-3 \pm 2i}$$

← SQUARE ROOT METHOD

④ $\frac{4(2x-3)^2}{4} = \frac{-100}{4}$ ← isolate $(\ )^2$

$\sqrt{(2x-3)^2} = \sqrt{-25}$ → take $\sqrt{}$ → ±

$\sqrt{25}i$

$2x - 3 = \pm 5i$

$+3 \quad +3$

$\frac{2x}{2} = \frac{3 \pm 5i}{2}$

$\boxed{x = \frac{3 \pm 5i}{2}}$