

PRACTICE - solving Quadratics

$$\textcircled{1} x^2 - 2x + 1 = 0$$
$$(x-1)(x-1) = 0$$
$$\boxed{x=1}$$

→ Factoring

$$\textcircled{2} \textcircled{3}x^2 - 5x + 12 = 0$$

	3x	4	
x	3x ²	4x	• -36
-3	-9x	-12	+ -5

-9^4

→ Factoring

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

$$\boxed{x=3, x=-4/3}$$

$$\textcircled{3} x^3 + 3x^2 - 28x = 0$$

$$x(x+7)(x-4) = 0$$

→ Factoring

$$\boxed{x=0, x=-7, x=4}$$

$$\textcircled{4} 4x^2 - 12x = 16 \rightarrow 4x^2 - 12x - 16 = 0$$

$$4(x^2 - 3x - 4) = 0$$

$$4(x-4)(x+1) = 0 \rightarrow \text{Factoring}$$

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

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

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

→ Factoring

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

$$\textcircled{6} \left(3 + \frac{1}{x} = \frac{10}{x^2}\right) x^2$$

$$3x^2 + x = 10$$

→ Factoring

$$\textcircled{3}x^2 + x - 10 = 0$$

	3x	-5	
x	3x ²	-5x	• -30
2	6x	-10	+ 1

$< \frac{4}{-5}$

$$(x+2)(3x-5) = 0$$

$$\boxed{x=-2, x=5/3}$$

$$\textcircled{7} \quad \underbrace{9y^2}_{3y} + \underbrace{12y}_{-2} - 8 = 0 \quad \rightarrow \text{Factoring}$$

$3y$	$9y^2$	$-12y$	$\cdot \frac{-12}{9}$
4	$12y$	-8	$+ \frac{6}{12}$

$\wedge -6$

$$(3y+4)(3y-2) = 0$$

$$\boxed{y = -4/3, y = 2/3}$$

$$\textcircled{8} \quad y^2 - 25 = 0$$

$$(y+5)(y-5) = 0 \quad \rightarrow \text{Factoring}$$

$$\boxed{y = -5, y = 5}$$

$$\textcircled{9} \quad 8x = x^2$$

$$x^2 - 8x = 0 \quad \rightarrow \text{Factoring}$$

$$x(x-8) = 0$$

$$\boxed{x = 0, x = 8}$$

$$\textcircled{10} \quad (x-5)(x+8) = -20$$

$$x^2 + 8x - 5x - 40 + 20 = 0 \quad \rightarrow \text{Not Factorable! Quad. Formula}$$

$$\textcircled{11} \quad \underbrace{1}_{a}x^2 + \underbrace{3}_{b}x - \underbrace{20}_{c} = 0$$

$$x = \frac{-3 \pm \sqrt{3^2 - 4(1)(-20)}}{2(1)}$$

$$\boxed{x = \frac{-3 \pm \sqrt{89}}{2}}$$

$$\textcircled{11} \quad \left(4 - \frac{1}{x} = \frac{3}{x^2}\right) x^2 \quad \rightarrow \text{Factoring}$$

$$4x^2 - x = 3$$

$$\textcircled{4}x^2 - x - \textcircled{3} = 0$$

x	$4x^2$	$3x$	$\cdot \frac{-12}{4}$	< -4
-1	$-4x$	-3	$+ \frac{-1}{-1}$	> 3

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

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

$$\textcircled{12} \textcircled{2}x^2 + \textcircled{-3}x + \textcircled{-7} = 0 \rightarrow \text{Not Factorable!} \\ \text{Quad. Formula}$$

$$x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(2)(-7)}}{2(2)}$$

$$x = \frac{3 \pm \sqrt{65}}{4}$$

$$\textcircled{13} x^2 + 2x = 0 \rightarrow \text{Factoring}$$

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

$$x = 0, x = -2$$

$$\textcircled{14} \textcircled{2}x^2 + \textcircled{4}x + \textcircled{-8} = 0 \rightarrow \text{Not Factorable!} \\ \text{Quad. Formula}$$

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

$$x = \frac{-4 \pm \sqrt{80}}{4} \leftarrow \frac{\sqrt{16} \cdot 4}{\sqrt{5}}$$

$$x = \frac{-4 \pm 4\sqrt{5}}{4}$$

$$x = -1 \pm \sqrt{5}$$

$$\textcircled{15} x^3 - 2x^2 + 3x - 6 = 0 \rightarrow \text{Factor by Grouping.}$$

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

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

$$x^2 = -3$$

$$x = 2$$

$x = \text{non-real solutions}$