

Solve by Completing the square. EH 8/15/19

Ex 1 $x^2 + 8x + 1 = 0$

$$x^2 + \boxed{8}x + 16 = -1 + 16$$

$b = 8 \rightarrow 4 \rightarrow 16 = c$
Half it Square it

Factor LHS
Combine RHS

$$(x+4)(x+4) = 15$$

$$(x+4)^2 = 15$$

$$x+4 = \pm\sqrt{15}$$

$$\boxed{x = -4 \pm \sqrt{15}}$$

Solve by $\sqrt{\quad}$ method

Don't forget \pm

Ex 2

$$x^2 + 12x = 2x - 5$$

$$x^2 + \boxed{10}x + 25 = -5 + 25$$

$b = 10 \rightarrow 5 \rightarrow 25$

$$(x+5)(x+5) = 20$$

$$(x+5)^2 = 20$$

$$x+5 = \pm\sqrt{20}$$

$$\boxed{x = -5 \pm 2\sqrt{5}}$$

$$\begin{array}{l} \sqrt{20} \\ \wedge \\ 4 \ 5 \\ \wedge \\ 2 \ 2 \end{array} \quad \leftarrow \sqrt{225} \\ \quad \quad \quad 2\sqrt{5}$$

Ex 3

$$2x^2 + 4x - 7 = 9$$

$$2x^2 + 4x = 16$$

$$x^2 + \boxed{2}x + 1 = 8 + 1$$

$$b = 2 \rightarrow 1 \rightarrow 1$$

$$(x+1)(x+1) = 9$$

$$(x+1)^2 = 9$$

$$x+1 = \pm 3$$

$$x = -1 \pm 3$$

$$x = -1 + 3 = 2$$

$$x = -1 - 3 = -4$$

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

Ex 4

$$3x^2 + \boxed{6}x + 3 = 5 + 3 * a \neq 1 *$$

$$b = 6 \rightarrow 3 \xrightarrow{\text{Half it}} 3 \xrightarrow{\text{Square it}} 9 \xrightarrow{\div a} 3 = c$$

$$3x^2 + 6x + 3 = 8$$

$$3(x^2 + 2x + 1) = 8$$

$$3(x+1)(x+1) = 8$$

$$3(x+1)^2 = 8$$

$$(x+1)^2 = \frac{8}{3}$$

$$x+1 = \pm \sqrt{\frac{8}{3}}$$

$$\boxed{x = -1 \pm \sqrt{\frac{8}{3}}}$$

Ex 6 $x^2 - x = 13$

$$x^2 - x - 13 = 0$$

$$a = 1 \quad b = -1 \quad c = -13$$

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

$$x = \frac{1 \pm \sqrt{53}}{2}$$

Ex 7 $-2x^2 + 13x - 1 = 0$

$$2x^2 - 13x + 1 = 0$$

$$a = 2 \quad b = -13 \quad c = 1$$

$$x = \frac{13 \pm \sqrt{169 - 4(2)}}{4}$$

$$x = \frac{13 \pm \sqrt{161}}{4}$$

Ex 8

$$x^2 = 6x$$

$$x^2 - 6x = 0$$

$$x(x - 6) = 0$$

$$x = 0$$

$$x - 6 = 0$$

$$x = 6$$

When b is odd

→ QF

$$ax^2 + bx + c = 0$$

Standard form

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Possible methods

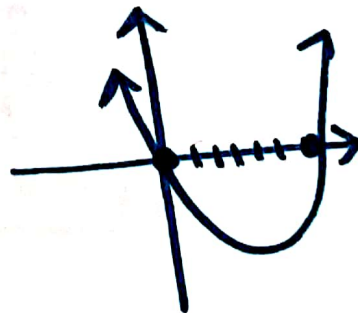
① Square Root

② Factoring

③ Complete the Square

④ Quad. Formula

Solve by factoring.



$$\text{Ex 5 : } 2x^2 + 8x - 7 = 0$$

$$2x^2 + \boxed{8}x + 8 = 7 + 8$$

$$b = 8 \rightarrow 4 \rightarrow 16 \rightarrow 8$$

$\frac{1}{2}it \quad \square it \quad \div a$

$$2x^2 + 8x + 8 = 15$$

$$2(x^2 + 4x + 4) = 15$$

$$2(x+2)^2 = 15$$

$$(x+2)^2 = 15/2$$

$$x+2 = \pm\sqrt{15/2}$$

$$\boxed{x = -2 \pm \sqrt{15/2}}$$

$$\text{Ex 6: } * 3x^2 + \boxed{12}x + 12 = 10 + 12$$

$$b = 12 \rightarrow 6 \rightarrow 36 \rightarrow 12$$

$$3(x^2 + 4x + 4) = 22$$

$$3(x+2)(x+2) = 22$$

$$* 3(x+2)^2 = 22$$

$$(x+2)^2 = 22/3$$

$$x+2 = \pm\sqrt{22/3}$$

$$\boxed{x = -2 \pm \sqrt{22/3}}$$

Ex $-9 - 7r^2 = -128$ Square Root Method
 $-7r^2 = -119$ Isolate x^2 term
 $r^2 = 17$ \div by a
 $r = \pm\sqrt{17}$ $\sqrt{\quad}$

Ex $(8n-1)(n+2) = 0$
 $8n-1=0$ $n+2=0$
 $8n=1$ $n=-2$
 $n = \frac{1}{8}$ $n = -2$

Ex $p^2+5p-3 = 3$
 $p^2+5p-6 = 0$
 $(p+6)(p-1) = 0$
 $p+6=0$ $p-1=0$
 $p = -6$ $p = 1$