

2.1 Quadratic Equations - Quadratic Formula 1

Tuesday, January 9, 2024 7:22 AM

صباح الخير
→

$$ax^2 + bx + c = 0, \quad a \neq 0$$

To solve

FM
Factoring Method

QF
Quadratic Formula

$$x = \frac{-b \pm \sqrt{\Delta}}{2a}$$

$$\Delta = b^2 - 4ac$$

التمييز
Discriminante

المعادلة لها حل حقيقي
إذا كان

$$\Delta \geq 0$$

Exp Solve this equation using QF

$$(x-2)^2 + 3(x-2) + \frac{9}{4} = 0$$

$$x^2 + 2(x)(-2) + (-2)^2 + 3x - 6 + \frac{9}{4} = 0$$

$$x^2 - 4x + 4 + 3x - 6 + \frac{9}{4} = 0$$

$$x^2 - x - 2 + \frac{9}{4} = 0$$

$$x^2 - x + \frac{1}{4} = 0$$

$$a=1, b=-1, c=\frac{1}{4}$$

معادلة
الدرجة الثانية

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

$$x = \frac{-b \pm \sqrt{\Delta}}{2a}$$

$$= \frac{-(-1) \pm \sqrt{0}}{2(1)}$$

$$x = \frac{1}{2}$$

أو
→ x-intercept

$$\Delta = b^2 - 4ac$$

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

$$= 1 - 1$$

$$\Delta = 0 \rightarrow \text{يوجد حل واحد فقط وهو}$$

$$x = \frac{-b}{2a}$$

check

$$(x-2)^2 + 3(x-2) + \frac{9}{4} = 0$$

$$(\frac{1}{2}-2)^2 + 3(\frac{1}{2}-2) + \frac{9}{4} \stackrel{?}{=} 0$$

$$(-\frac{3}{2})^2 + 3(-\frac{3}{2}) + \frac{9}{4} \stackrel{?}{=} 0$$

$$\frac{9}{4} - \frac{9 \cdot 2}{2 \cdot 2} + \frac{9}{4} \stackrel{?}{=} 0$$

$$\frac{9 - 18 + 9}{4} \stackrel{?}{=} 0$$

$$\frac{1}{2} - 2 = \frac{1}{2} - \frac{4}{2} = \frac{-3}{2}$$

4

$$\frac{0}{4} = 0$$

$$0 = 0 \checkmark$$

Exp Solve this equation $-2x^2 + x + 1 = 0$ using QF
 هذه المعادلة مكتوبة في الصورة العامة ؟ نعم
 $a = -2, b = 1, c = 1$

القانون العام
 $\downarrow$
 QF

$$x = \frac{-b \pm \sqrt{D}}{2a}$$

$$D = b^2 - 4ac$$

$$= (1)^2 - 4(-2)(1)$$

$$= 1 - -8$$

$$= 9 \text{ موجب} \rightarrow \text{يوجد حلين}$$

$$\sqrt{9} = 3$$

$$\sqrt{4} = 2$$

$$\sqrt{1} = 1$$

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$$x_1 = \frac{-1 + 3}{-4} = \frac{2}{-4} = -\frac{1}{2}$$

$$x_2 = \frac{-1 - 3}{-4} = \frac{-4}{-4} = 1$$