

3.5 solve by Quadratic Formula

steps

- ① Put equation in standard form.

$$\boxed{a}x^2 + \boxed{b}x + \boxed{c} = 0$$

- ② Identify \boxed{a} , \boxed{b} & \boxed{c} .

- ③ substitute into the quadratic formula:

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

- ④ simplify and reduce, if necessary.

Ex.1 Solve $3 = 8x - 12x^2$ by using quadratic formula.

$$3 = 8x - 12x^2$$

$$0 = -12x^2 + 8x - 3$$

$$a = -12$$

$$b = 8$$

$$c = -3$$

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

$$x = \frac{-8 \pm \sqrt{(8)^2 - 4(-12)(-3)}}{2(-12)}$$

$$x = \frac{-8 \pm \sqrt{-80}}{-24}$$

$$x = \frac{-8 \pm 4i\sqrt{5}}{-24}$$

$$\boxed{x = \frac{-2 \pm i\sqrt{5}}{-6}}$$

Discriminant
 $b^2 - 4ac$

$$80 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 5$$
$$\begin{matrix} 8 & 10 \\ \wedge & \wedge \\ 4 & 2 & 2 & 5 \\ \wedge & & & \\ 2 & 2 & & \end{matrix}$$
$$4\sqrt{5}$$

Ex.2 solve $0 = -12 + 9x - 4x^2$ by using quadratic formula.

$$0 = -4x^2 + 9x - 12 \quad x = \frac{-9 \pm \sqrt{(9)^2 - 4(-4)(-12)}}{2(-4)}$$

$$a = -4$$

$$b = 9$$

$$c = -12$$

$$x = \frac{-9 \pm \sqrt{-111}}{-8}$$

$$111 \\ 3 \wedge 37$$

$$x = \frac{-9 \pm i\sqrt{111}}{-8}$$

Test Taking Tip(s):

- The answer for Ex.2 could also be written as $x = \frac{9 \pm i\sqrt{111}}{8}$
- If you are struggling to simplify your final answer, you can type the two expressions separately & compare to your answer choices.

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For Frac to Dec

MATH

2) DEC

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For Frac

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