

$ax^2 + bx + c = 0$ Complete the square

$$\frac{ax^2}{a} + \frac{bx}{a} = \frac{-c}{a}$$

$$x^2 + \frac{b}{a}x + \left(\frac{b}{2a}\right)^2 = \frac{-c}{a} + \frac{b^2}{4a^2}$$

$$\left(x + \frac{b}{2a}\right)^2 = \frac{-4ac}{4a^2} + \frac{b^2}{4a^2}$$

$$\left(x + \frac{b}{2a}\right)^2 = \frac{b^2 - 4ac}{4a^2}$$

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

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

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

* QUADRATIC FORMULA

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

discriminant = d
 $b^2 - 4ac$

PREMADE PANCAKE MIX

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

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

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

	FACT / PERF SQ (Factorable)
$d > 0$	2 real solutions $\checkmark$
$d = 0$	1 real solution $x = -\frac{b}{2a}$
$d < 0$	0 real solutions (2 complex solutions)

VALUE
OF
DISCRIMINANT

MEANING

$$(15) \quad 6a^2 - a = 4 + 10a^2$$

$$0 = 4a^2 + a + 4$$

$$4a^2 + a + 4 = 0$$

$$a = 4$$

$$b^2 - 4ac$$

$$b = 1$$

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

$$c = 4$$

$$1 - 64 = \boxed{-63 = d}$$

$$a = \frac{-b \pm \sqrt{d}}{2a} = \frac{-1 \pm i\sqrt{63}}{8}$$

$$\boxed{a = \frac{-1 \pm 3i\sqrt{7}}{8}}$$

CK
?

$$\textcircled{17} \quad -x^2 + 8x + 7 = -5x^2$$

$$+5x^2 \qquad \qquad \qquad +5x^2$$

$$4x^2 + 8x + 7 = 0$$

$$a = 4$$

$$b^2 - 4ac$$

$$b = 8$$

$$(8)^2 - 4(4)(7)$$

$$c = 7$$

$$64 - 112 = -48 = d$$

$$x = \frac{-b \pm \sqrt{d}}{2a} = \frac{-8 \pm \sqrt{-48}}{8}$$

$\sqrt{48}$	$\sqrt{48}$
$\sqrt{4} \sqrt{12}$	$\sqrt{16} \sqrt{3}$
$2 \sqrt{12}$	$\downarrow \downarrow$
$\downarrow \downarrow$	
$2 \sqrt{4} \sqrt{3}$	
$4 \sqrt{3}$	$4 \sqrt{3}$

$$x = \frac{-8 \pm i \sqrt{48}}{8}$$

$$x = \frac{-8 \pm 4i \sqrt{3}}{8}$$

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

CK
?

$$(27) \quad 6x^2 + 23 = 11$$

$$6x^2 + 0x + 12 = 0$$

$$a = 6$$

$$b^2 - 4ac$$

$$b = 0$$

$$(0)^2 - 4(6)(12)$$

$$c = 12$$

$$-288 = d$$

$$x = \frac{-b \pm \sqrt{d}}{2a} = \frac{\pm i\sqrt{288}}{12}$$

$$= \frac{\pm 2i\sqrt{72}}{12}$$

$$= \frac{\pm 6i\sqrt{8}}{12}$$

$$= \frac{\pm 12i\sqrt{2}}{12}$$

$$= \boxed{\pm i\sqrt{2}} \checkmark$$

ck

$$6(i\sqrt{2})^2 + 23 \stackrel{?}{=} 11$$

$$6(-1)(2) + 23 \stackrel{?}{=} 11$$

$$-12 + 23 = 11 \checkmark$$