Complex Roots

- remember the discriminant? b^2-4ac.
  - → we said if it was negative there was NO REAL roots because there is complex roots

complex numbers

$a + bi$

↑ ↑

imaginary

* cannot combine

imaginary numbers

$i = \sqrt{-1}$

$i^2 = -1$

simplifying

$\sqrt{40} = \sqrt{4}\sqrt{10} = 2\sqrt{10}$

now...

$\sqrt{-40} = \sqrt{-1}\sqrt{4}\sqrt{10} = 2i\sqrt{10}$

solving for x

ex $x^2+4=0$

$\sqrt{x^2} = \sqrt{-4}$

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

$x = \pm\sqrt{-1}\sqrt{4}$

$\boxed{x = \pm 2i}$

ex $x^2-2x+10=0$

$a=1, b=-2, c=10$

$$x = \frac{2 \pm \sqrt{(-2)^2-4(1)(10)}}{2(1)}$$

$$x = \frac{2 \pm \sqrt{-36}}{2}$$

$$x = \frac{2 \pm 6i}{2}$$

$\boxed{x = 1 \pm 3i}$