

## In-class examples:

Ex. 1 Find the zeroes of  $f(x) = 3x^2 - 5x + 2$ 

First try to factor:

$$3x^2 - 5x + 2 = 0$$

$$(3x - 2)(x - 1) = 0$$

$$3x - 2 = 0 \quad x - 1 = 0$$

$$\boxed{x = \frac{2}{3} \quad x = 1}$$

## Quadratic Equation

If you don't prefer factoring or equation cannot be factored  $\rightarrow$  use Quadratic Formula

$$x = \frac{5 \pm \sqrt{25 - 4(3)(2)}}{6}$$

$$x = \frac{5 \pm \sqrt{1}}{6}$$

$$x = \frac{5+1}{6} \quad x = \frac{5-1}{6}$$

$$\boxed{x = 1 \quad x = \frac{2}{3}}$$

Ex. 2 Find the zeroes of  $f(x) = e^{x-3} - 4$ 

$$e^{x-3} - 4 = 0$$

Isolate  $e^{\square}$ 

$$e^{x-3} = 4$$

Apply  $\ln$  to both sides to cancel  $e$ 

$$\ln e^{x-3} = \ln 4$$

$$x - 3 = \ln 4$$

$$\boxed{x = 3 + \ln 4}$$

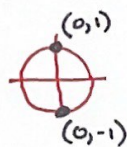
 $\leftarrow$  leave answer as exactEx. 3 Find the zeroes of  $f(x) = \cos 2x$  in  $[0, 2\pi)$ .

$$\cos 2x = 0$$

 $\leftarrow$  when does  $\cos x = 0$ ?

$$2x = \frac{\pi}{2} \text{ and } \frac{3\pi}{2}$$

$$\boxed{x = \frac{\pi}{4} \text{ and } \frac{3\pi}{4}}$$

Ex. 4 Find the zeroes of  $f(x) = \ln x - 3$ 

$$\ln x - 3 = 0$$

Isolate  $\ln x$ 

$$\ln x = 3$$

Apply  $e^{\square}$  to both sides to cancel  $\ln$ 

$$e^{\ln x} = e^3$$

$$\boxed{x = e^3}$$

 $\leftarrow$  leave answer as exact