

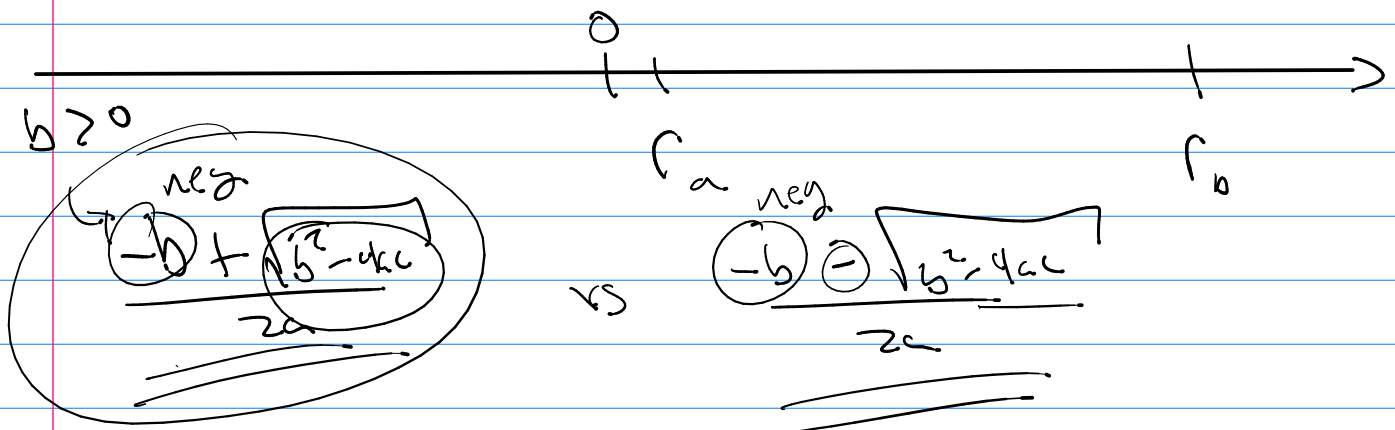
Math 451

Q's $ax^2 + bx + c = 0$

(1) $r_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

(2) $(x - r_1)(x - r_2) = 0$
 $x^2 - (r_1 + r_2)x + r_1 r_2 = 0$
 $x^2 + \left[\frac{b}{a} \right] x + \left[\frac{c}{a} \right] = 0$

$r_1 r_2 = \frac{c}{a} \rightarrow$ known $\rightarrow r_2 = \frac{c}{a r_1}$



$r_1 = \frac{-b - \text{Sign}(b) \sqrt{b^2 - 4ac}}{2a}$

$x^2 - 4 = 0$

$r_2 = \frac{c}{a r_1}$

$$\textcircled{3} \quad X = \frac{-\left(\frac{b}{2}\right) \pm \sqrt{\left(\frac{b}{2}\right)^2 - ac}}{2a}$$

$$X = \frac{-\left(\frac{b}{2}\right) \pm \sqrt{\left(\frac{b}{2}\right)^2 - ac}}{a}$$

Taylor Series $e =$

$$f(x) = f(0) + f'(0) \cdot x + \frac{f''(0)}{2!} x^2 + \frac{f^{(3)}(0)}{3!} x^3 + \dots$$

Near $x=0$

$$e^x = 1 + x + \frac{1}{2!} x^2 + \frac{1}{3!} x^3 + \dots$$

$$e = 0 + \frac{1}{0!} + \frac{1}{1!} + \frac{1}{2!} + \frac{1}{3!} + \frac{1}{4!}$$

$$\sin(x) = \left[x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \dots \right]$$

$$\cos(x) = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \dots$$

→ approx by using only Some terms

How many terms? → ① pick the number of terms
 → ② use more terms until a tolerance is met.

① Fix terms \rightarrow For loop

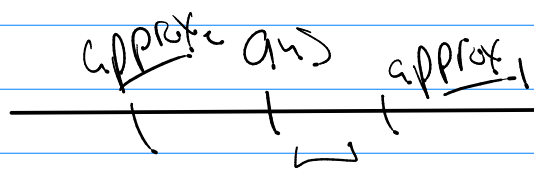
(partial sum?)

(partial prod?)

② tolerance?

\rightarrow approx ans 1

\rightarrow approx ans 2



while $\text{abs}(\text{approx ans 2} - \text{approx ans 1}) > \text{tol}$

$\text{approx}_1 = \text{approx}_2$

$\text{approx}_2 = (\text{find a better approx})$

end

add more terms

$p = 1$

$\rightarrow \boxed{p} = p * i;$

$a_2 = a_2 + y_p;$

$2x^2 + x - 3$
 $\rightarrow p = [2, 1, -3]$
pdyval