

Math 451

$$Q5 \text{ (1)} \quad r_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$(2) \quad r_1 = \frac{-b - \text{sign}(b) \sqrt{b^2 - 4ac}}{2a} \quad r_2 = \frac{c}{ar_1}$$

$$(3) \quad r_1 = \frac{-(b/2) - \text{sign}(b/2) \sqrt{(b/2)^2 - ac}}{a} \quad r_2 = \frac{c}{ar_1}$$

→ Test case:

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

$$(x+3)(x-2) = 0 \quad \&$$

$$(6)x^2 + (5)x + (-21) = 0 \quad x = -3 \quad x = 2$$

$$(2x-3)(3x+7) = 0$$

$$x = 3/2 \quad x = -7/3$$

$$x^2 + 0x - 4 = 0$$

$$(x+2)(x-2) = 0$$

$$x = -2 \quad x = 2$$

if $b == 0$

$$s = 1$$

else

$$s = \text{sign}(b)$$

return

$$r_1 = \frac{-b - s \sqrt{b^2 - 4ac}}{2a}$$

$$a_{ij} = i - j$$

5x5

$$A = \begin{bmatrix} a_{11} & a_{12} & \dots & a_{15} \\ a_{21} & a_{22} & \dots & a_{25} \\ \vdots & \vdots & \ddots & \vdots \\ a_{51} & \dots & \dots & a_{55} \end{bmatrix}$$

$j=1$ $j=2$ $j=5$
 \downarrow \downarrow \downarrow

$\leftarrow i=1$
 $\leftarrow i=2$

$$A = \begin{bmatrix} 0 & -1 & -2 & -3 & -4 \\ 1 & 0 & -1 & -2 & -3 \\ 2 & 1 & 0 & -1 & -2 \\ 3 & 2 & 1 & 0 & -1 \\ 4 & 3 & 2 & 1 & 0 \end{bmatrix} = [a_{ij} = (i-j)]$$

Exam 1

110 pts = 100%

Mon \rightarrow InClass (2 probs) \leftarrow Pencil/pen only
 Mon \rightarrow Wed Take Home (4 probs) \leftarrow You only

InClass

①, ② "You are Matlab"

$$a = [1:2:8]$$

output?

$$a(end) = []$$

output?

$$p = [1 \ 2 \ -3 \ 4]'$$

$$[\text{length}(p)-1 \ : \ -1 \ : \ 0] .* p$$

output

$$\text{ones}(3,1) .* [1 \ 4 \ 2]$$

etc

3) write matlab code for ..

a) IF

b) Switch

4) write matlab code for ..

a) For loop

b) while loop

5) write a script to do something like the ch2 HW.

6) given a function for $\exp(x)$

and it doesn't work!

(Fix it)

7 write a function
either deriv. of a poly
or
integral of a poly. (const=0)

ex $p = 2x^2 + x - 3$ $p' = 4x + 1$
 $\int p dx = \frac{2}{3}x^3 + \frac{1}{2}x^2 - 3x$

$pderiv([2, 1, -3])$

output $\rightarrow [4, 1]$

$polyint([2, 1, -3])$

output $\rightarrow [\frac{2}{3}, \frac{1}{2}, -3, 0]$

8 Function from 4.2 & book (exp.m)

take home

1 (take all the stuff from 1-2 in class)

2 Create a seq using if/switch/for/while
(scripts)

3

4

funcs:

$exp(x)$, $\sinh(x)$, $\text{cubicFormula}()$,
 $\text{trapz}()$, $\text{poly}()$, $\text{pderiv}()$
switch

