ECE 316 Test 10 S09

(Closed Book and Notes, 3 by 5 Card, Formula Sheet, Calculator, 20 minutes)
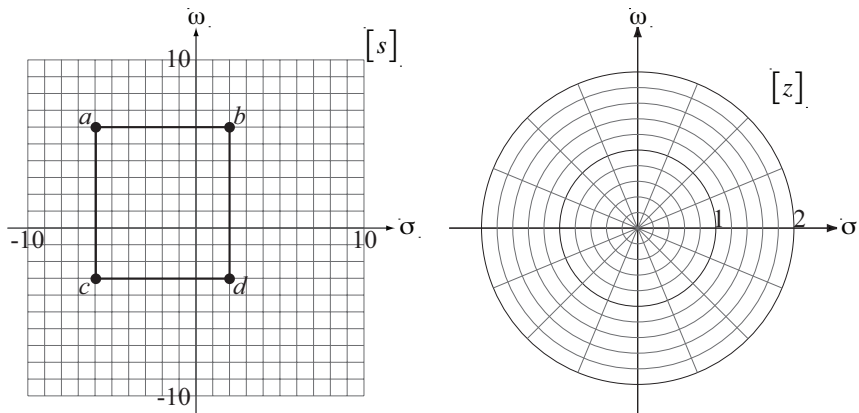
If any question or problem is incomplete, ambiguous or contradictory, explain why. If you are correct you will receive full credit on that question or problem.

Using the mapping relationship $z = e^{sT_s}$ and a sampling rate of $f_s = 10 = 1/T_s$, draw the contour in the z plane that corresponds to the given contour in the s plane. Find the numerical values of the magnitude and angle (in radians) of the points a, b, c and d in the z plane that correspond to the points a, b, c and d in the s plane.

(Contour 8 pts)

z plane locations: (3 pts each) $|a| =$_____ , $|b| =$_____ , $|c| =$_____ , $|d| =$_____

(3 pts each) $\angle a =$_____ , $\angle b =$_____ , $\angle c =$_____ , $\angle d =$_____

Solution to ECE Test 10 S09

Using the mapping relationship $z = e^{sT_s}$ and a sampling rate of $f_s = 10 = 1/T_s$, draw the contour in the z plane that corresponds to the given contour in the s plane. Find the numerical values of the magnitude and angle (in radians) of the points a, b, c and d in the z plane that correspond to the points a, b, c and d in the s plane.

(Contour 8 pts)

z plane locations:　　(3 pts each) $|a| =$_____ , $|b| =$_____ , $|c| =$_____ , $|d| =$_____

　　　　　　　　　　(3 pts each) $\angle a =$_____ , $\angle b =$_____ , $\angle c =$_____ , $\angle d =$_____

$$a = e^{(-6+j6)/10} = e^{-0.6}e^{j0.6} = 0.5488\angle 0.6$$

$$b = e^{(2+j6)/10} = e^{0.2}e^{j0.6} = 1.221\angle 0.6$$

$$c = e^{(-6-j3)/10} = e^{-0.6}e^{-j0.3} = 0.5488\angle -0.3$$

$$d = e^{(2-j3)/10} = e^{0.2}e^{-j0.3} = 1.221\angle -0.3$$

ECE 316 Test 10 S09

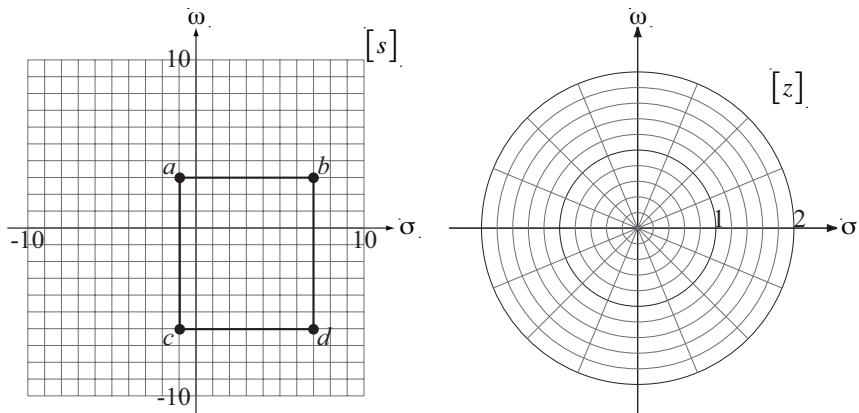### (Closed Book and Notes, 3 by 5 Card, Formula Sheet, Calculator, 20 minutes)

If any question or problem is incomplete, ambiguous or contradictory, explain why. If you are correct you will receive full credit on that question or problem.

Using the mapping relationship $z = e^{sT_s}$ and a sampling rate of $f_s = 10 = 1/T_s$, draw the contour in the z plane that corresponds to the given contour in the s plane. Find the numerical values of the magnitude and angle (in radians) of the points a, b, c and d in the z plane that correspond to the points a, b, c and d in the s plane.

(Contour 8 pts)

z plane locations: (3 pts each) $|a| = \underline{\hspace{2cm}}$, $|b| = \underline{\hspace{2cm}}$, $|c| = \underline{\hspace{2cm}}$, $|d| = \underline{\hspace{2cm}}$

(3 pts each) $\angle a = \underline{\hspace{2cm}}$, $\angle b = \underline{\hspace{2cm}}$, $\angle c = \underline{\hspace{2cm}}$, $\angle d = \underline{\hspace{2cm}}$

Solution to ECE Test 10 S09

Using the mapping relationship $z = e^{sT_s}$ and a sampling rate of $f_s = 10 = 1/T_s$, draw the contour in the z plane that corresponds to the given contour in the s plane. Find the numerical values of the magnitude and angle (in radians) of the points a, b, c and d in the z plane that correspond to the points a, b, c and d in the s plane.

(Contour 8 pts)

z plane locations: (3 pts each) $|a| =$_____ , $|b| =$_____ , $|c| =$_____ , $|d| =$_____

(3 pts each) $\angle a =$_____ , $\angle b =$_____ , $\angle c =$_____ , $\angle d =$_____

$$a = e^{(-1+j3)/10} = e^{-0.1}e^{j0.3} = 0.9048\angle 0.3$$

$$b = e^{(7+j3)/10} = e^{0.7}e^{j0.3} = 2.014\angle 0.3$$

$$c = e^{(-1-j6)/10} = e^{-0.1}e^{-j0.6} = 0.9048\angle -0.6$$

$$d = e^{(7-j6)/10} = e^{0.7}e^{-j0.6} = 2.014\angle -0.6$$
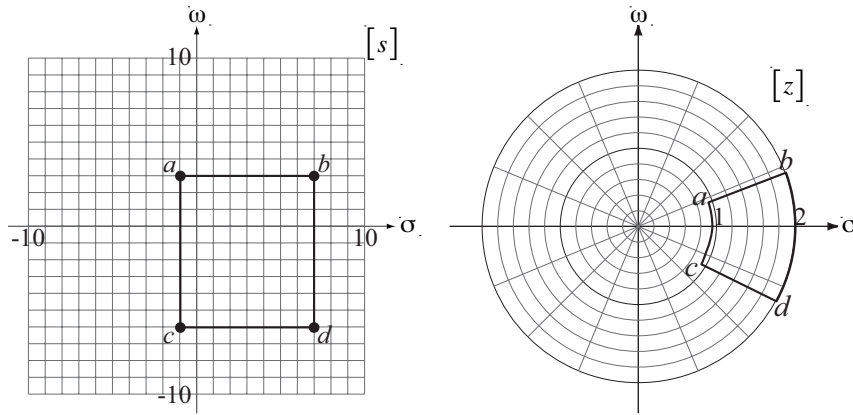
Student Identification Number ☐☐☐ – ☐☐ – ☐☐☐☐ (No name please)

By entering my student identification number I affirm that I have neither given nor received help from anyone on this test.

ECE 316 Test 10 S09

(Closed Book and Notes, 3 by 5 Card, Formula Sheet, Calculator, 20 minutes)
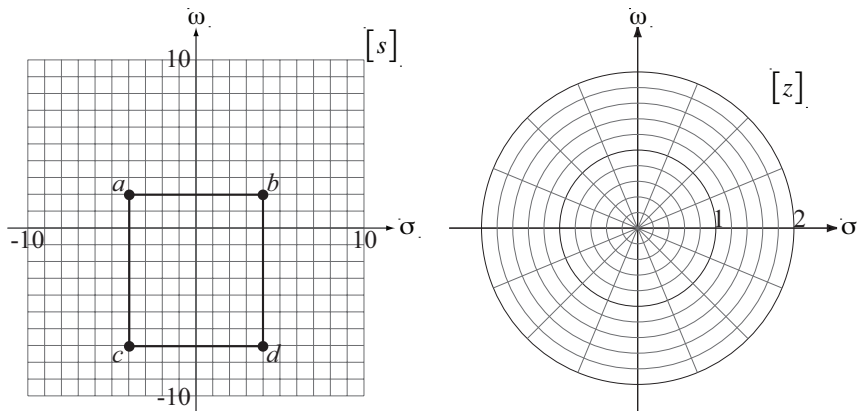
If any question or problem is incomplete, ambiguous or contradictory, explain why. If you are correct you will receive full credit on that question or problem.

Using the mapping relationship $z = e^{sT_s}$ and a sampling rate of $f_s = 10 = 1/T_s$, draw the contour in the z plane that corresponds to the given contour in the s plane. Find the numerical values of the magnitude and angle (in radians) of the points a, b, c and d in the z plane that correspond to the points a, b, c and d in the s plane.

(Contour 8 pts)

z plane locations: (3 pts each) $|a| =$_____ , $|b| =$_____ , $|c| =$_____ , $|d| =$_____

(3 pts each) $\angle a =$_____ , $\angle b =$_____ , $\angle c =$_____ , $\angle d =$_____

Solution to ECE Test 10 S09

Using the mapping relationship $z = e^{sT_s}$ and a sampling rate of $f_s = 10 = 1/T_s$, draw the contour in the z plane that corresponds to the given contour in the s plane. Find the numerical values of the magnitude and angle (in radians) of the points a, b, c and d in the z plane that correspond to the points a, b, c and d in the s plane.

(Contour 8 pts)

z plane locations: (3 pts each) $|a| =$_____ , $|b| =$_____ , $|c| =$_____ , $|d| =$_____

(3 pts each) $\angle a =$_____ , $\angle b =$_____ , $\angle c =$_____ , $\angle d =$_____

$$a = e^{(-4+j2)/10} = e^{-0.4}e^{j0.2} = 0.6703\angle 0.2$$

$$b = e^{(4+j2)/10} = e^{0.4}e^{j0.2} = 1.492\angle 0.2$$

$$c = e^{(-4-j7)/10} = e^{-0.4}e^{-j0.7} = 0.6703\angle -0.7$$

$$d = e^{(4-j7)/10} = e^{0.4}e^{-j0.7} = 1.492\angle -0.7$$