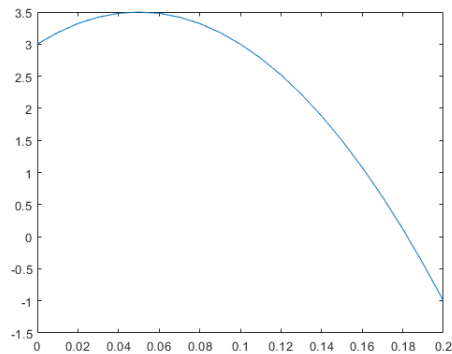


1. (a) Create an anonymous function for  $10e^{-2x}$  and use it to graph the interval  $0 \leq x \leq 2$ .
- (b) Create an anonymous function of  $20x^2 - 200x + 3$  and use it draw the function for the interval  $0 \leq x \leq 0.2$ , with the step 0.01 and find where the  $f(x)=0$  is approximated.
- (c) Use the “fzero” function to accurately find the position of the  $f(x)=0$  of the function in (b).

```
x=0:0.01:0.2;
y=(20.*x)-200.*(x.^2)+3;
plot(x,y)
```



2. The table below shows the hourly wages, worked hours, and output (number of products) for five product operators (産品作業員) in a week.

	作業員				
	1	2	3	4	5
時薪 (\$)	5	5.50	6.50	6	6.25
工作时数	40	43	37	50	45
産出 (産品数)	1000	1100	1000	1200	1100

Use MATLAB to answer the following questions:

- a. How much salary did each worker earn this week?
- b. What is the total salary paid?
- c. How many units are manufactured?
- d. What is the average cost per unit of output?
- e. How many hours does it take on average to produce a product?
- f. Assuming that each operator produces the same quality product, which operator is the most efficient? And which one is the most inefficient?

3. A fenced enclosed area consists of a rectangle of length  $L$  and width  $2R$ , and a semicircle of radius  $R$ , as shown in Figure P.4. The area  $A$  of this enclosed area is 2000 square feet. Fence costs \$50 per foot for curved sections and \$40 per foot for straight sections. Use the “fminsearch” function to determine  $R$  and  $L$  that minimize the cost of fencing at a resolution of 0.01 feet. Also calculate the minimum cost.

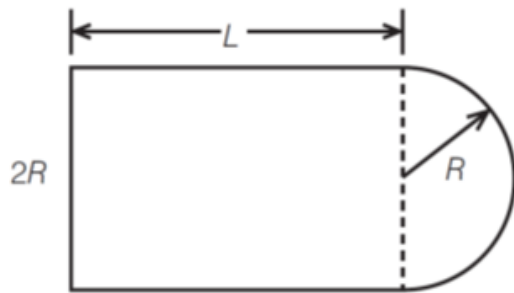


Fig P.4

3.14 The area is found from

$$A = 2RL + 0.5\pi R^2$$

Solve for  $L$ :

$$L = \frac{A - 0.5\pi R^2}{2R}$$

The optimum radius is 21.4270 feet, and the corresponding length is 29.8414 feet. The minimum cost is \$7467.20.

4. Write a MATLAB SUB-function (\*.m) to evaluate the members of the sequence, where  $a$ , and  $n$  are the inputs and the sequence value of  $x_n = a^{n+1}/n!$  is the output of this SUB-function and save it as a script file. Then, write a main function to input the range of the value  $n$  from 0 to 20, and  $a=2$ , and call the SUB-function to evaluate the sequence value, and display the value of  $n$  and  $x_n$  by using “fprintf”, as the following format:

$n$	$x_n$
0	2
1	4
2	4
3	8/3

5. In MATLAB, input the following matrix, and use this matrix to answer the following questions.

$$\mathbf{A} = \begin{pmatrix} \mathbf{2} & \mathbf{-3} & \mathbf{6} & \mathbf{2} & \mathbf{5} \\ \mathbf{-2} & \mathbf{3} & \mathbf{-3} & \mathbf{-3} & \mathbf{-4} \\ \mathbf{4} & \mathbf{-6} & \mathbf{9} & \mathbf{5} & \mathbf{9} \\ \mathbf{-2} & \mathbf{3} & \mathbf{3} & \mathbf{-4} & \mathbf{1} \end{pmatrix}$$

- Construct a 4x3 matrix B, its elements is the third column through 5th column of A
  - Construct a 2x5 matrix C, its elements is the second row through 4th row of A
  - Construct 2x3 matrix D, its elements is the first two rows and the last three columns of A
- 6.

A palindrome is a sequence of characters that is the same whether you read it forwards or backwards. Some examples of palindromes are:

```
r a c e c a r
r a t s   l i v e   o n   n o   e v i l   s t a r
```

Often in presenting palindromes, spacing and punctuation are ignored, which allows for more examples and easier reading:

```
"Go hang a salami, I'm a lasagna hog!"
"Never odd or even"
"Drab as a fool, aloof as a bard."
"T. Eliot, top bard, notes putrid tang emanating, is sad.
  I'd assign it a name: gnat dirt upset on drab pot-toilet."
```

For our purposes, we'll be assuming that all punctuation and spacing has been stripped from a string before it is given to us. You will write two functions—one iterative, one recursive—that determine whether a string is a palindrome or not.

Write a recursive function to check a palindrome. function is\_  
pal = pal1(str)