Chương 1,2,3

Ví dụ

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Câu hỏi

Cho biết kết quả khi chạy đoạn script sau:

```
n = 10;
fact = 1;

for k = 1:n
    fact = k * fact;
    disp( [k fact] )
end
```

Kết quả:
- Tính gì?
- Kết quả xuất ra màn hình?

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1	1
2	2
3	6
4	24
5	120
6	720
7	5040
8	40320
9	362880
10	3628800

10!

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Câu hỏi

```
x = 0 : pi/20 : 6 * pi;
plot(x, exp(-0.2*x) .* sin(x), 'r'),grid
```

Kết quả:
Phạm vi biểu diễn trục hoành?
Đường biểu diễn có dạng gì?
Màu đường?
Lưới?

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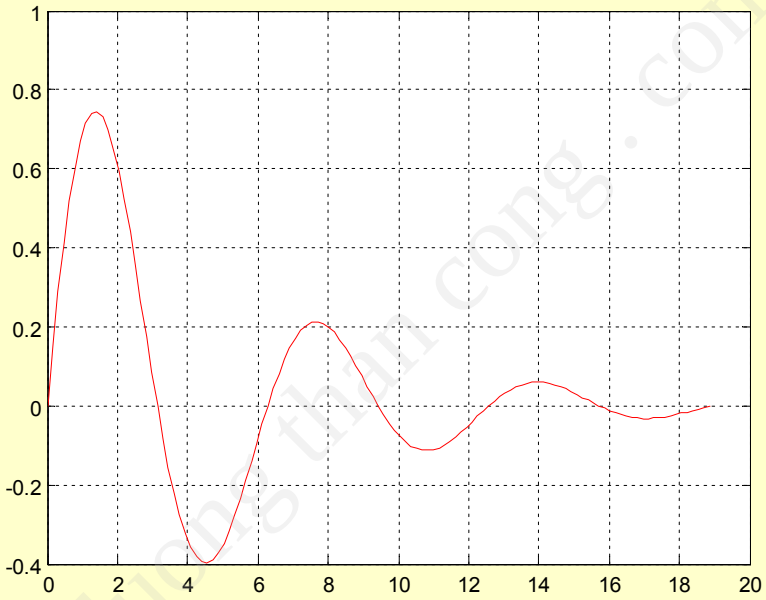

$$e^{-0.2x} \sin(x)$$

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Câu hỏi

```
ssuma = 0;
for n=0:500
    ssuma = ssuma + 1/( (2*n+1)^2 * (2*n+3)^2 );
end
ssuma
```

Kết quả:
- Tính gì?
- Kết quả xuất ra màn hình?

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ssuma =

0.1169

$$\frac{1}{1^2 \cdot 3^2} + \frac{1}{3^2 \cdot 5^2} + \frac{1}{5^2 \cdot 7^2} + \cdots = \frac{\pi^2 - 8}{16}.$$ (sum is 0.1169, with 500 terms)

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Câu hỏi

```
sign = -1;
s = 0;
for n = 1:9999
sign = -sign;
s = s + sign / n;
end
s
```

Kết quả:
- Tính gì?
- Kết quả xuất ra màn hình?

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```
>> s

s =

    0.6932

>> log(2)

ans =

    0.6931
```

ln(2)

$$1 - \frac{1}{2} + \frac{1}{3} - \frac{1}{4} + \frac{1}{5} - \cdots$$

```
log10(2)

ans =

    0.3010
```

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Câu hỏi

```
clear;clc
a = 1;
b = 0;
c = b^2/(4*a);
x = 0:.2:4;
y = a.*(x-2).^2 + b.*(x-2) + c;
plot(x,y)
```

- Kết quả trên màn hình?

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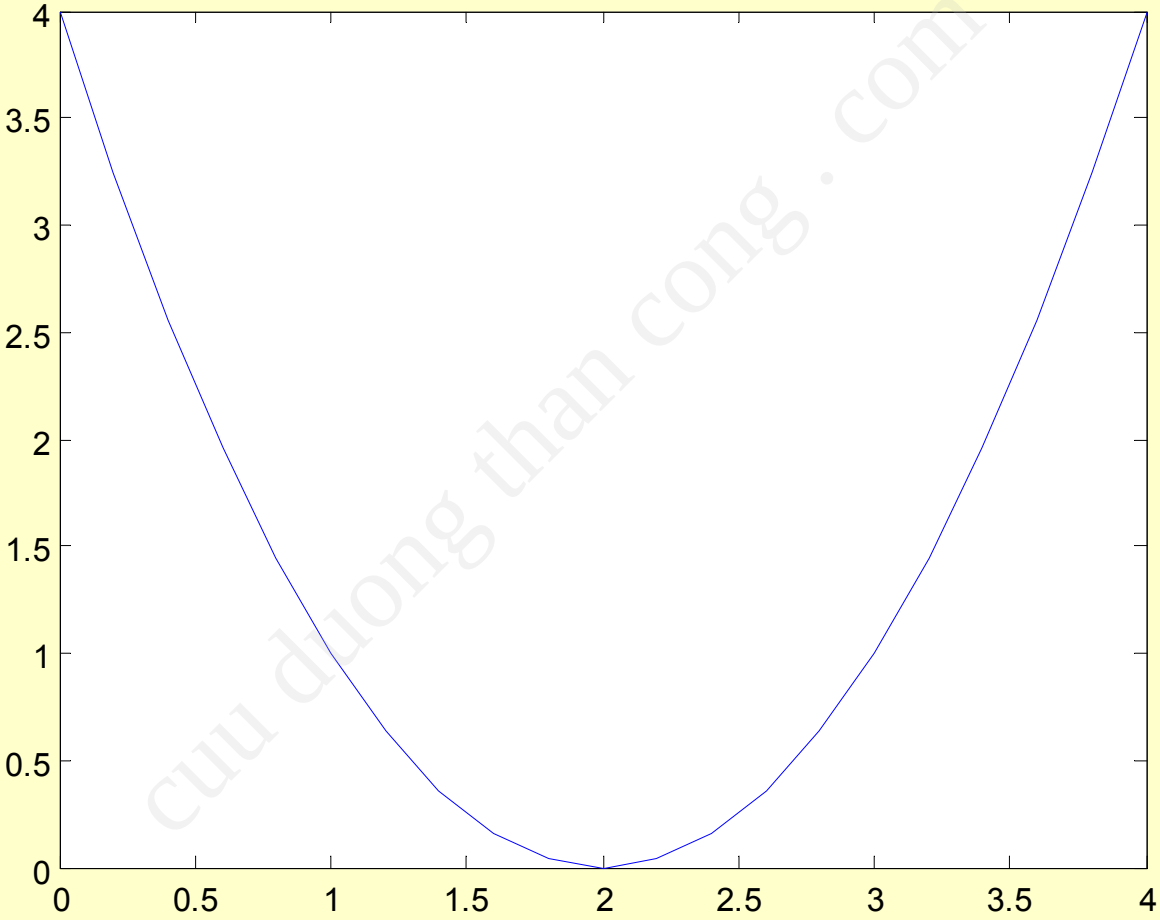

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Chương trình mẫu

`b^2 < 4*a*c`	$(b^2 < 4ac)$
`x >= 0`	$(x \geq 0)$
`a ~= 0`	$(a \neq 0)$
`b^2 == 4*a*c`	$(b^2 = 4ac)$

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Chương trình mẫu

```
a = input(' Input a = ');
b = input(' Input b = ');
c = input(' Input c = ');
%
if a==0 & b==0 & c==0
    disp(' PT Vo dinh')
elseif a==0 & b==0
    disp(' PT Vo nghiem')
elseif a==0
    x = -c/b
    disp(' Mot nghiem x= ')
elseif b^2 < 4*a*c
    x1 = (-b + sqrt(b^2 - 4*a*c))/(2*a);
    x2 = (-b - sqrt(b^2 - 4*a*c))/(2*a);
    disp(' Nghiem phuc x1,x2 '),disp([x1 x2])
elseif b^2 == 4*a*c
    x = -b/(2*a)
    disp('Nghiem kep')
else
    x1 = (-b + sqrt(b^2 - 4*a*c))/(2*a);
    x2 = (-b - sqrt(b^2 - 4*a*c))/(2*a);
    disp('Hai nghiem x1, x2: '),disp([x1 x2])
end
```

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Câu hỏi

```
bal = 15000 * rand;

% bal: balance, so tien gui
% rate: lai suat theo nam
% newbal: so tien  gop lai va goc sau 1 nam

if bal < 5000
 rate = 0.09;
elseif bal < 10000
 rate = 0.12;
else
 rate = 0.15;
end

newbal = bal + rate * bal;
format bank
disp( 'New balance is:' )
disp( newbal )
```

Help format

FORMAT BANK: Fixed format for dollars and cents.

Hãy cho biết cách tính lãi suất của ngân hàng trên?

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Câu hỏi

```
hold on
x = 0:pi/40:3*pi;
y = sin(x);
y = y .* (y > 0);
axis([0 10 0 2])
plot(x, y)
hold off
```

Hãy cho biết CT vẽ đồ thị gì, giới hạn các trục?

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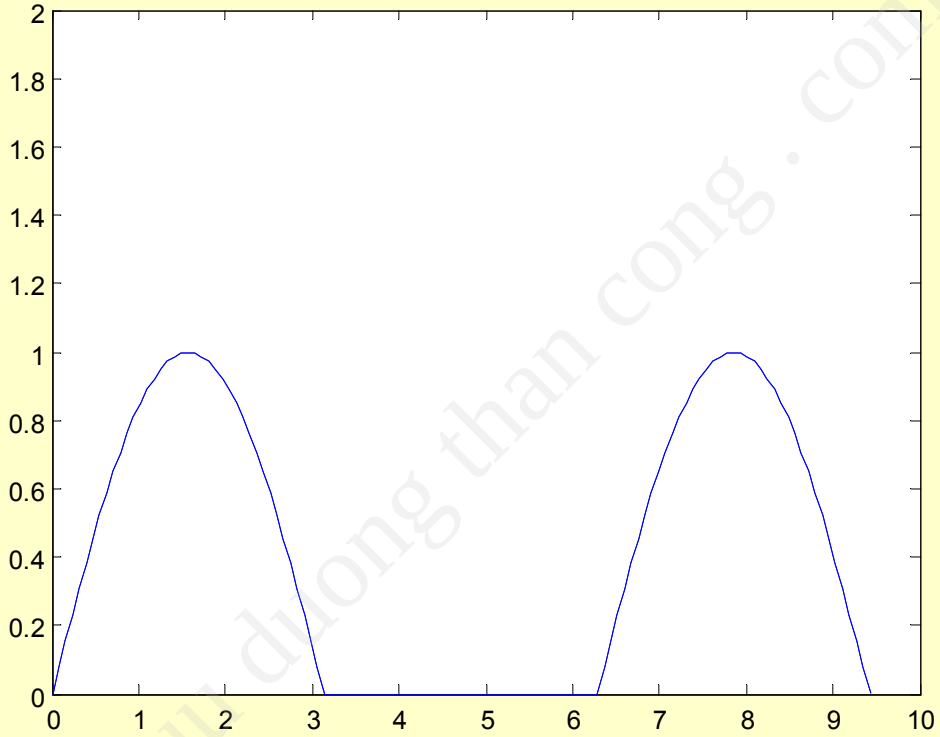

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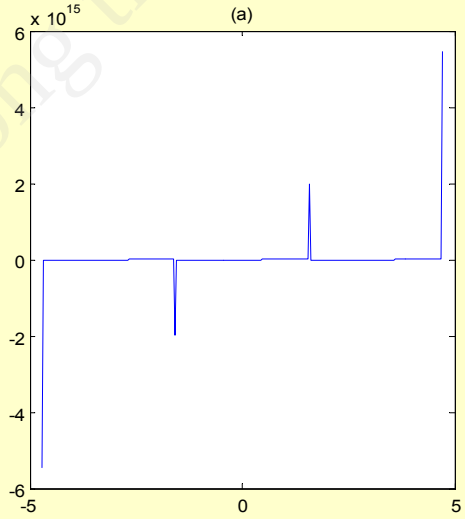
Thủ thuật tránh chia 0 hay kết quả quá lớn

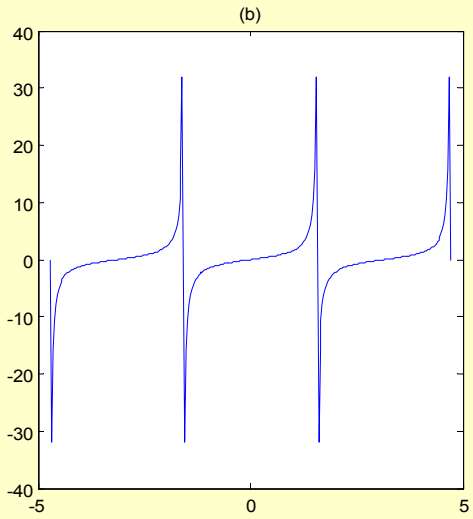
```
%Tránh chia cho zero

x = -4*pi : pi/20 : 4*pi;
x=x+(x== 0)*eps;                    % x=0 --> x=eps
y = sin(x) ./ x;
plot(x, y)
```

%Tránh vô cực: tại các bội số lẻ của pi/2 giá trị tan() tiến tới vô cực và giá trị hiển thị trên đồ thị sẽ rất lớn.

```
hold on
subplot(1,2,1)
x = -3/2*pi:pi/100:3/2*pi;
y = tan(x);
plot(x,y),title('(a)')
y = y .* (abs(y) < 1e10);
subplot(1,2,2)
plot(x,y),title('(b)')
hold off
```





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Chương trình mẫu tính thuế thu nhập

```
inc = [5000 10000 15000 30000 50000];

for ti = inc

 if ti < 10000
   tax = 0.1 * ti;
 elseif ti < 20000
   tax = 1000 + 0.2 * (ti - 10000);
 else
   tax = 3000 + 0.5 * (ti - 20000);
 end;

 disp( [ti tax] )
end;
```

5000	500
10000	1000
15000	2000
30000	8000
50000	18000

Taxable income	Tax payable
$10 000 or less	10 percent of taxable income
between $10 000 and $20 000	$1000 + 20 percent of amount by which taxable income exceeds $10 000
more than $20 000	$3000 + 50 percent of amount by which taxable income exceeds $20 000

The tax payable on a taxable income of $30 000, for example, is

$3000 + 50 percent of ($30 000 – $20 000), i.e. $8000.

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Câu hỏi

Hãy viết lại CT dùng phép toán logic

```
inc = [5000 10000 15000 30000 50000];

tax = 0.1 * inc .* (inc <= 10000);
tax = tax + (                          ) ...
                    .* (                ) + 1000);
tax = tax + (           ) .* (0.5 * (       ) + 3000);

disp( [inc' tax'] );
```

Taxable income	Tax payable
$10 000 or less	10 percent of taxable income
between $10 000 and $20 000	$1000 + 20 percent of amount by which taxable income exceeds $10 000
more than $20 000	$3000 + 50 percent of amount by which taxable income exceeds $20 000

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$3000 + 50 percent of ($30 000 – $20 000), i.e. $8000.

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```
inc = [5000 10000 15000 30000 50000];

tax = 0.1 * inc .* (inc <= 10000);
tax = tax + (inc > 10000 & inc <= 20000) ...
                    .* (0.2 * (inc-10000) + 1000);
tax = tax + (inc > 20000) .* (0.5 * (inc-20000) + 3000);

disp( [inc' tax'] );
```

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Bài tập: Viết chương trình tính thuế thu nhập các nhân ở VN.

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